

RIPDES Phase II Stormwater Management Plan

Providence
Rhode Island

Prepared for **Rhode Island Department of Transportation
Providence, Rhode Island**

Prepared by ***VHB*/Vanassee Hangen Brustlin, Inc.
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Introduction

The Rhode Island Department of Transportation (RIDOT) contracted Vanasse Hangen Brustlin, Inc. (VHB) to assist them in the preparation of their Storm Water Management Program Plan (SWMPP) to achieve compliance with the Rhode Island Department of Environmental Management (RIDEM) *General Permit for Storm Water Discharge from Small Municipal Separate Storm Sewer Systems (MS4s) and from Industrial Activity at Eligible Facilities Operated by Regulated Small MS4s (RIRI4000, December 19, 2003)* [General Permit]. This RIPDES General Permit directs operators of small MS4s to develop plans and procedures to control potential storm water pollutants. The lead responsible groups for the SWMPP are the RIDOT Office of Environmental and Intermodal Planning and the Maintenance Office.

This document provides descriptions of the methods RIDOT proposes to implement to address the Six Minimum Measures, and the rationale behind each proposed task or best management practice.

Mission

The mission of RIDOT is:

“To maintain and provide a safe, efficient, environmentally, aesthetically and culturally sensitive intermodal transportation network that offers a variety of convenient, cost-effective mobility opportunities for people and the movement of goods supporting economic development and improved quality of life.”

Goals

RIDOT seeks to implement its mission through policy and action, with particular emphasis on the following goals:

- Promote mobility for people and goods through a balanced, multi-modal transportation system.
- Direct investment and development to existing communities, urban concentrations, and designated economic growth areas.

- Develop methods for assessing the fiscal impact and cost-benefit analysis of development for use by both state and local governments when considering infrastructure investments and land-use policies.
- Encourage redevelopment and improve livability of existing communities and urban areas; and guide new employment to under-used commercial and industrial sites.
- Attain sufficient state funding within a real Transportation Trust Fund.
- Attain and then maintain an appropriate level of system preservation or service to our customers.
- Look for and participate in opportunities for public/private cost sharing projects.
- Deliver operating systems, services, programs, and projects in the most cost effective manner possible.
- Make public participation and a customer service focus, integral parts of the development of RIDOT programs, projects, and services.
- Make media awareness and public participation a focus that is integrated with RIDOT's programs, projects and services via the Communications, Community Affairs, and the Transportation Operations Center.
- Provide employees with opportunities to enhance their level of preparedness and performance so they can do the best job possible in the duties they are assigned.

Regulatory requirement

Under the Phase II Environmental Protection Agency Storm Water regulations [40 CFR Parts 9, 122, 123, and 124: National Pollutant Discharge Elimination System (NPDES) -- Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule] published in the Federal Register on December 8, 1999, portions of the highway drainage system owned and operated by RIDOT meet the definition of a regulated Municipal Separate Storm Sewer Systems (MS4s). According to 40 CFR 122.26(b)(8), "municipal separate storm sewer" is defined as a conveyance or system of conveyances including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains:

- (i) "Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the Clean Water Act that discharges into waters of the United States;
- (ii) Designed or used for collecting or conveying Storm Water;
- (iii) Which is not a combined sewer; and
- (iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

Federal and State-operated small MS4s can include universities, prisons, hospitals, roads (i.e. departments of transportation), military bases (e.g. State Army National Guard), parks and office buildings/complexes.

In Rhode Island, the Rhode Island Department of Environmental Management (RIDEM) has been delegated the authority to regulate storm water discharges regulated under the NPDES Program. In accordance with the Rhode Island Pollutant Discharge Elimination System (RIPDES) Regulations (RIDEM 2003), operators of regulated small MS4s are required to:

- Apply for RIPDES permit coverage by the "Effective Date" of the General Permit Rhode Island Pollutant Discharge Elimination System Storm Water Discharge from Small Municipal Separate Storm Sewer Systems and from Industrial Activity at Eligible Facilities Operated by Regulated Small MS4s;
- Develop a Storm Water Management Program which includes the six minimum control measures. The plan outlining the Storm Water Management Program must identify existing program compliance and proposed programs which will address the RIPDES General Permit requirements;
- Implement the Storm Water Management Program using appropriate storm water management controls, or "best management practices" (BMPs), over the five year term of the permit term;
- Develop measurable goals for the program; and
- Annually evaluate effectiveness of the program and submit progress reports.

The ultimate objective of each of these steps should be protecting water quality. A regulated small MS4 operator's Storm Water Management Program must be designed to:

- Reduce the discharge of pollutants from its MS4 to the "maximum extent practicable" (MEP);
- Protect water quality; and
- Satisfy the appropriate water quality requirements of the Clean Water Act.

General Objectives of the SWMPP

In order to develop this SWMPP, RIDOT assembled a Storm Water Advisory Committee (Committee) consisting of representatives of each division within RIDOT. The Committee met 16 times over the past several months to review the SWMPP requirements and discuss how best to address them.

The consensus among the Committee members was that much of the public is not aware of the problem of non-point source pollution or more specifically the function of storm drains or the unintentional effects their day-to-day activities may have on water quality. The Committee further concluded that the SWMPP should focus on

educating RIDOT personnel on non-point source pollution, and improving the effectiveness of selected BMPs and the frequency of implementation.

Based on the completed Total Maximum Daily Load (TMDL) studies in Rhode Island¹ and the 2002 303(d) list finalized in March 2003 for other rivers and water bodies in the State, fecal coliform is a priority pollutant that must be addressed by this SWMPP. RIDOT has been investigating pigeon abatement measures for bridges and underpasses statewide, as well as site specific measures to address bacteria and other storm water contaminants as part of an ongoing effort to improve water quality of its discharges to impaired waters. The Committee felt that education and outreach efforts focusing on how non-point source contaminants, including fecal coliform, can contribute to pollutant loading of waterways, and that improving public and personal awareness could bring incremental improvements in water quality without large investments in infrastructure.

Document Organization

The following document satisfies the requirements for developing a Storm Water Management Program. The remaining sections of this document include:

- *Section 2.0: Program Management and Storm Water Advisory Committee* - This section identifies the general information regarding RIDOT's storm water management infrastructure including responsible parties, the team of RIDOT personnel who are responsible for implementing and coordinating the Storm Water Management Program, and a discussion of the team responsibilities.
- *Section 3.0: Minimum Control Measures* - A discussion of the six minimum control measures required by RIDEM, and the RIDOT approach to addressing these measures.
- *Section 4.0: Additional Requirements* - A discussion of the additional requirements included in the RIPDES MS4 permit including Endangered or Threatened Species Habitat, Essential Fish Habitat, National Register of Historic Properties, Discharges to Impaired Waterways, and Discharges with Established TMDLs.
- *Section 5.0: Evaluation and Assessment* - A summary of evaluation mechanisms and reporting requirements.
- *Section 6.0: References* - A list of publications cited in the body of this document.



¹ Stafford Pond, Hunt River, Fry Brook, Scrabbletown Brook, Runnins River, Barrington River, Palmer River, Narrow River, Gilbert Stuart Stream, Mumford Brook, Crooked Brook, Saugatucket River, Mitchell Rocky Brooks, and Indian Run Brook.

Storm Water Advisory Committee

Committee Organization

This section identifies RIDOT Storm Water Advisory Committee, responsible for implementing and coordinating the Storm Water Management Plan, and briefly describes the team's responsibilities.

The following individuals have helped to develop the Storm Water Management Plan and will serve as RIDOT Storm Water Advisory Committee:

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Responsibilities

The Storm Water Advisory Committee is responsible for:

- Annual evaluation of the effectiveness of current BMPs. The annual report should include recommendations for revisions, deletions and/or additions to BMPs.
- Annual evaluation of the continued applicability of the measurable goals for each of the six minimum control measures with input from RIDOT division(s) responsible for the measurable goal. Based on this evaluation, the annual report may include a recommendation for revising, adding, or deleting measurable goals from the SWMPP.
- Preparation and submittal of annual reports to RIDEM. Annual reports must include a narrative and/or numerical summary of how RIDOT has met the measurable goals for each of the six minimum controls over the last year, and an evaluation of current BMPs and measurable goals.

Implementation and coordination of each of the measures described in the SWMPP will be the responsibility of the division(s) indicated in the SWMPP schedule.

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Six Minimum Control Measures

The operator must develop, implement and enforce a program to reduce the discharge of pollutants from the MS4 to the maximum extent practicable, protect water quality, and satisfy the water quality requirements of the Federal Clean Water Act and Rhode Island Water Quality Standards. The plan has been designed to meet the requirements of the six minimum control measures listed below:

1. Public Education and Outreach
2. Public Participation and Involvement
3. Illicit Discharge Detection and Elimination
4. Construction Site Runoff Control
5. Post-Construction Runoff Control
6. Good Housekeeping Measures for Municipal Operations

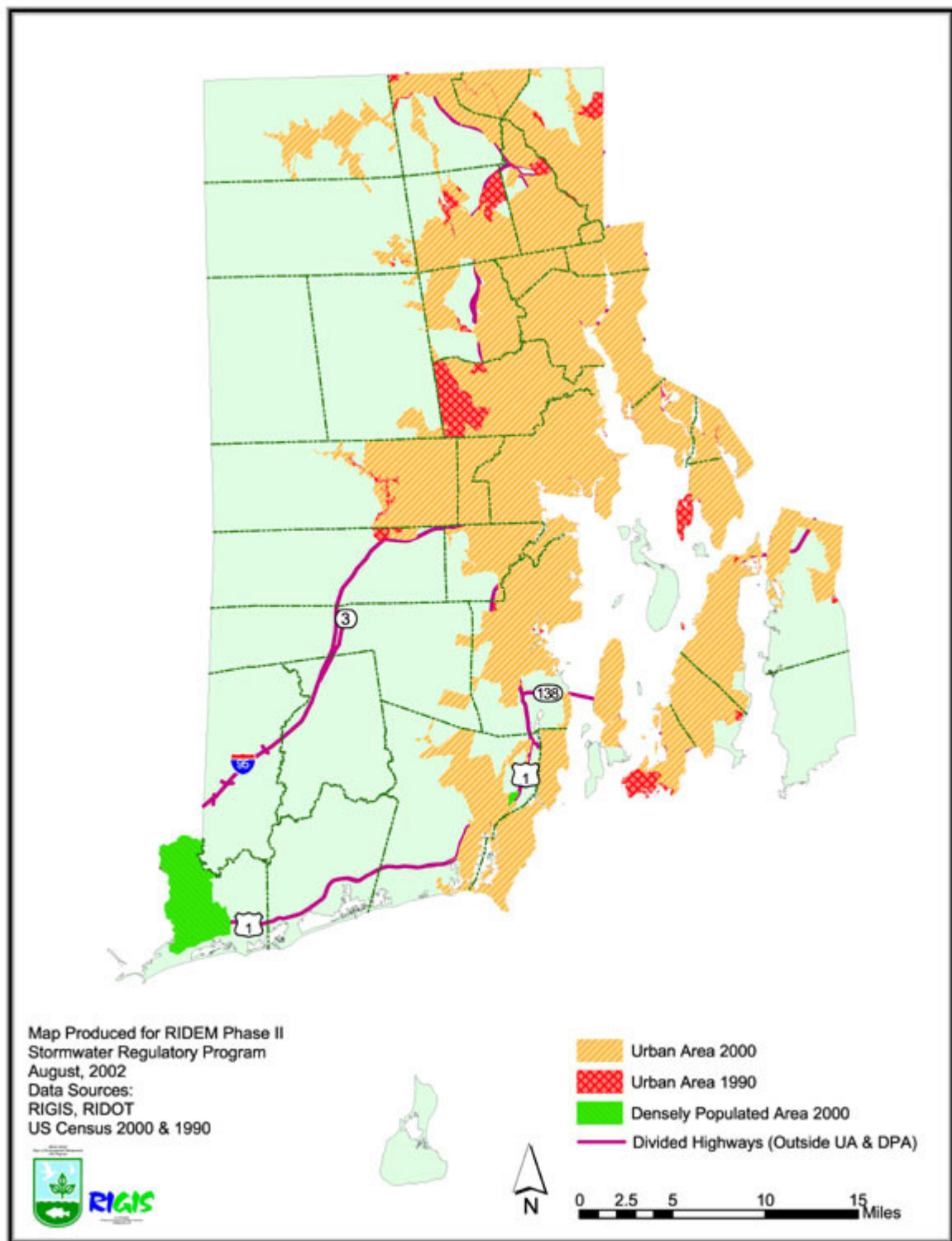
The requirements apply to the urbanized areas, as shown on Figure 1.

General Requirements

For each of the six minimum measures listed, RIDOT has identified BMPs to achieve compliance with the measure and has identified the department responsible for implementation. The general requirements for each minimum measure as listed in the regulations are included in the SWMPP as follows.

- Identify the person(s) or department responsible or sharing responsibility for the implementation of the measure. Identify the minimum measure being addressed.
- Identify all BMPs to be implemented for full compliance with the measure.
- Identify measurable goals for each BMP. Identify time-lines and milestones for BMP implementation, including as appropriate months and years in which the operator will undertake required actions, interim milestones, and frequency of activities.
- Identify all impaired water bodies within regulated areas (if applicable).
- Identify TMDL requirements or other water quality determination provisions (if applicable).

Figure 1: Urbanized Area Map





Prioritize Plan Implementation

The SWMPP prioritizes listed impaired waters for improvement, and Outstanding Natural Resource Waters (ONRWs) and Special Resource Protection Waters (SRPWs) for protection in terms of BMP implementation.

RIDOT has prioritized the following impaired waters for the implementation of the SWMPP:

- Stafford Pond
- Barrington River
- Hunt River
- Scrabbletown Brook
- Fry Brook
- Runnins River
- Palmer River
- Narrow River
- Gilbert Stuart Stream and Mumford Brook
- Crooked Brook
- Saugatucket River, Mitchell Rocky Brooks, and Indian Run Brook
- Scarborough Beach
- State and Municipal Beaches

These waterbodies have been highlighted for maximum storm water runoff quality improvement due to their identification as completed TMDLs and inclusion on the most recent Rhode Island 303(d) List of Impaired Waters or otherwise identified for storm water quality improvement by RIDEM and the Department of Health.

Information reviewed to date indicates that there are 113 waterbodies listed as SRPWs in Rhode Island, which include all waters which are of at least a first (1st) order stream size, excluding their wetlands, and are tributary to public drinking water supplies.

ONRWs are defined as waters of National and State Parks, wildlife refuges, and other waters designated as having special recreational or ecological value. VHB coordinated with Ms. Connie Carey at the RIDEM Office of Water Resources regarding ONRWs. Ms. Carey indicated that there are no waterbodies identified as ONRWs in Rhode Island. RIDOT will seek to achieve the highest level of protection of waterbodies classified as SRPWs.



Identify Water Bodies and Outfalls

RIDOT has identified a portion of its MS4 outfalls and the receiving waters at the time of filing this permit. The receiving waters and known number of outfalls discharging to each water body are listed below.

- Blackstone River Watershed- 783 outfalls
- Stafford Pond and Taunton River Watershed - 16 outfalls
- Saugatucket River Sub-Basin- 73 outfalls

A map of known outfalls and receiving waterbodies, and a copy of RIDOT's data collection form are included in Attachment B. RIDOT will identify the remaining outfalls within the regulated area in accordance with the mapping requirements under Minimum Measure 3.



Critical Habitat and Endangered Species

RIDOT has not identified discharges to critical habitats of listed or proposed to be listed endangered or threatened species. As outfalls are mapped, RIDOT will submit information in the subsequent Annual Reports on potential impacts to endangered or threatened species associated with outfall locations, if found.



Cooperation with Other Entities

Implementation of one or more of the minimum measures may be shared with another entity, or the entity may fully implement the measure if consistent with the permit requirements as stated in Section IV.A.1 of the General Permit.

At this time, RIDOT is not relying on other entities to fulfill requirements of this permit. However, there are some areas under municipal control that are known or suspected to interconnect with RIDOT facilities. In these instances, there will be close coordination between RIDOT and the appropriate entity relative to BMP implementation.



Qualifying Local Programs

"A qualifying local program (QLP) is a State or local storm water management program that RIDEM has determined imposes the relevant requirements in Rule 31(e)(3)(ii) of the RIPDES Regulations. A QLP may be referenced by the operator to satisfy the requirements of Part IV.B of the General Permit. In order to reduce duplication of effort, municipalities may accept a permit from RIDEM Freshwater

Wetlands and Water Quality Certification Programs, and the Coastal Resources Management Council (CRMC) to meet the requirements for site plan and SWPPP reviews for Construction Site Storm Water Runoff Control and Post-Construction Storm Water Management in New Development and Redevelopment. Municipalities may also accept a permit from the RIDEM RIPDES Program in accordance to the limitations described in Part IV.B.4.b.5 of the General Permit for Construction Site Storm Water Runoff Control and Part IV.B.5.b.5. of the General Permit for Post-Construction Storm Water Management.”

At this time RIDOT does not have the authority to develop a QLP, nor is RIDOT subject to the authority of any QLPs. RIDOT will continue to seek authorization from the RIDEM RIPDES Program, as applicable, pursuant to the General Permit for Storm Water Associated with Construction Activity.

Best Management Practice Decision Process

RIDOT developed their SWMPP in accordance with RIPDES Regulations and addressed each of the requirements of the General Permit. RIDOT developed appropriate BMPs through an extensive decision process.

RIDOT contracted Vanasse Hangen Brustlin, Inc. (VHB) in February 2003 to assist them in preparing the SWMPP. The following meetings were held to discuss the Plan:

February 11, 2003

Representatives from RIDOT met with VHB to kick off the project and to plan meetings with the Storm Water Advisory Committee. There was a discussion of existing and potential programs RIDOT could employ to address the Public Education and Outreach, and Illicit Discharge Detection and Elimination measures that could be included in the SWMPP.

February 18, 2003

RIDOT Storm Water Committee met with VHB to begin developing the SWMPP. Personnel in RIDOT’s Public Information Section provided information on existing programs that could be modified to incorporate a storm water component. Measures discussed included Public Education and Outreach, and Public Participation/Involvement.

February 25, 2003

VHB met with RIDOT personnel to give a slide presentation on the NPDES Phase II requirements. Subsequent discussions focused on Illicit Discharge Detection and Elimination, and Public Education and Outreach/Participation and Involvement.

February 28, 2003

Representatives from RIDOT met with VHB to discuss the Public Education and Outreach/Participation and Involvement, and Illicit Discharge Detection and Elimination Measures.

March 4, 2003

Representatives from RIDOT met with VHB to discuss Post Construction Storm Water Controls and Construction Site Runoff Controls.

March 11, 2003

Representatives of RIDOT and VHB met to review the draft outline of RIDOT's 5-year plan.

March 12, 2003

Representatives of RIDOT and VHB met to discuss Illicit Discharge Detection and Elimination. RIDOT interns have collected a significant amount of data to date on outfalls, but it was determined that the progress has not been rapid enough to complete the mapping within the required time frame. It was decided that one or more consultants should be hired to complete the outfall mapping.

March 18, 2003

RIDOT and VHB met to discuss Construction Site Runoff Controls.

March 25, 2003

RIDOT and VHB met to discuss preparing a Request for Proposals (RFP) for outfall mapping.

March 30, 2003

RIDOT and VHB met to discuss Post Construction Storm Water Controls.

April 2, 2003

Representatives of RIDOT, VHB and the City of Cranston met to discuss the issues faced during the outfall mapping project recently completed in Cranston.

May 15, 2003

Representatives of RIDOT, VHB, and the Narragansett Bay Commission (NBC) met to discuss NBC's experiences during their recent mapping project.

June 20, 2003

RIDOT and VHB met to review the project status.

September 29, 2003

RIDOT and VHB met to discuss preparation of the outfall mapping RFP.

March 23, 2004

RIDOT and VHB met to review proposed programs for Minimum Measures 1, 2, 4, 5, and 6.

March 25, 2004

RIDOT and VHB met to review proposed programs for Measure 3.

Following these and other internal RIDOT meetings, VHB compiled RIDOT's comments and sent a draft of the 5-year plan to RIDOT for review and comment in order to finalize the entire plan.

BMPs to be implemented as part of Public Education and Outreach and Public Involvement (Measures 1 and 2) focus upon a partnership with the University of Rhode Island (URI) Cooperative Extension to provide training and outreach to other municipalities struggling to meet Phase II requirements and internal education of RIDOT personnel concentrating on improvement of current RIDOT facilities by improving designs and implementing maintenance projects.

Minimum measures to be implemented for Measures 3-6 focus on mapping and sampling, construction site runoff, and general pollution control.

The BMPs for all six Minimum Control Measures are shown in outline form in Attachment A.

Measure 1 - Public Education and Outreach



Permit Requirement

The operator must implement an ongoing public education program to distribute education material to the community over the term of the permit. The public education program must provide information concerning the impact of storm water discharges to water bodies. It must address steps and/or activities that the public can take to reduce the pollutants in storm water runoff.



Best Management Practices – Rationale Statement

RIDOT will focus educational efforts on municipal and state officials working on implementation of SWMPPs and RIDOT personnel. Working with the URI

Cooperative Extension, RIDOT will provide outreach to municipal and state officials in the form of training opportunities as well as public educational information allowing the conveyance of a coordinated storm water message at both the state and local level. Internal education of RIDOT personnel will begin with basic education regarding storm water and progress to discussions of modifications to existing RIDOT properties to better control storm water and erosion.

Success of Measure

Environmental and Intermodal Planning will oversee the BMPs and will be responsible for compiling and submitting the Annual Report. The Annual Report will include an evaluation of the BMPs implemented in the previous year and the success of the practice.

The success of the partnership with URI Cooperative Extension will be determined by the submittal of deliverables in a timely manner, post-survey of those attending training sessions and pre- and post- survey of target audiences for public outreach efforts. The success of internal training will also be evaluated by pre- and post-surveys of those attending training.

Cost of Measure

At the present time it is difficult to estimate the actual costs for each of the proposed measures. If it is deemed that additional funds are required beyond that which may reasonable be requested in annual budgets, additional evaluations for funding sources will need to be completed.



Best Management Practices – Implementation Plan

RIDOT will implement the following BMPs to achieve compliance with the requirements of **Measure 1**:

1A, 1B) Partner with URI Cooperative Extension to Provide Training to State and Municipal Officials and Coordinated Public Outreach Message

<i>Responsible Party:</i>	Environmental and Intermodal Planning
<i>Target Audience:</i>	State and Municipal Officials and Residents
<i>Target Pollutant Sources:</i>	Various
<i>Description:</i>	See full details in Attachment C.
<i>Measurable Goals:</i>	See full details in Attachment C. Execute MOA in Year 3

1C) Storm Water Page on RIDOT Website

<i>Responsible Party:</i>	Public Information Department/Environmental and Intermodal Planning
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<i>Target Audience:</i>	Residents and professionals
<i>Target Pollutant Sources:</i>	Hazardous waste, bacteria, and sand and sediment on roadways
<i>Description:</i>	The website will provide a description of the Phase II program, RIDOT's SWMPP, links to related sites, and a web based resource library.
<i>Measurable Goals:</i>	Year 2: Create storm water website. Year 2-5: Update website regularly.

1D) Public Storm Water Information in Internal Newsletters

<i>Responsible Party:</i>	Public Information Department/Environmental and Intermodal Planning
<i>Target Audience:</i>	State personnel
<i>Target Pollutant Sources:</i>	Any/all potential storm water pollutants
<i>Description:</i>	The RIDOT will develop a storm water related article and publish in the RIDOT and Department of Administration newsletters.
<i>Measurable Goals:</i>	Year 3: Write and publish one storm water article in newsletter.

1E) Winter Training

<i>Responsible Party:</i>	Environmental and Intermodal Planning
<i>Target Audience:</i>	RIDOT personnel
<i>Target Pollutant Sources:</i>	Any/all potential storm water pollutants
<i>Description:</i>	RIDOT personnel attend winter training sessions each year. Training includes erosion control and source reduction.
<i>Measurable Goals:</i>	Year 2-5: Existing ongoing program.

1F) Storm Water Training

<i>Responsible Party:</i>	Environmental and Intermodal Planning
<i>Target Audience:</i>	RIDOT personnel
<i>Target Pollutant Sources:</i>	Any/all potential storm water pollutants
<i>Description:</i>	RIDOT will incorporate storm water specific training into the annual training.
<i>Measurable Goals:</i>	Year 2-5: Storm Water training provided.

Measure 2 - Public Participation/Involvement



Permit Requirement

All Public Participation/Involvement activities must comply with State and local public notice requirements.



Best Management Practices – Rationale Statement

RIDOT's Public Participation and Involvement program will focus on residents and special interest groups state-wide. RIDOT Committee felt that opportunities for public participation and involvement in RIDOT programs would be difficult to implement due to the complexity of RIDOT projects, as well as diverting limited resources away from transportation improvement projects which is the primary goal of RIDOT.

The general public will have the opportunity to comment on the final SWMPP when DEM puts the document out to public notice. Through this process the public will comment directly to DEM and DEM will forward any comments on the document to RIDOT. RIDOT will then respond to each comment. The annual SWMPP report will be available for public review and comment through a public notice. If more than 25 requests for a public hearing are received during the comment period RIDOT will hold a public hearing. Otherwise, comments will be reviewed and responses prepared and documented. During this process comments will also be accepted for suggested program amendments.

RIDOT will focus on providing funding and material resources to groups involved in existing programs for litter control and clean up efforts, creating a partnership with a public or private entity to develop and fund a public participation program, continuing RIDOT internal training and funding projects through the Enhancement Program. The following table provides a listing of recently completed and on-going storm water related projects funded through the Enhancement Program.

Enhancement projects typically consist of a partnership between RIDOT and another entity.

Table 1 Planned RIDOT Enhancements Projects that will serve to Improve Water Quality

Enhancement Project	Project No.	Town	Year of Anticipated Implementation	Additional Project Details
Storm Water Enhancements	ENHR-036	Bristol	2003	Storm water enhancements to improve water quality
Storm Water Enhancements	ENHR-069	Warren	2003	Storm water enhancements to improve water quality
Arnold Road Storm Water Improvements	TEA2-119	Coventry	2007	Storm water enhancements to improve water quality
Storm Water Retrofits	ENHR-204	Exeter	2004	Storm water enhancements to improve water quality
Main Street Storm Water Improvements	TEA2-009	N. Kingstown	2005	Storm water enhancements to improve water quality

Table 1 Planned RIDOT Enhancements Projects that will serve to Improve Water Quality (Continued)

Enhancement Project	Project No.	Town	Year of Anticipated Implementation	Additional Project Details
Union Street Runoff Improvements	TEAC-070	Portsmouth	2004	Storm water enhancements to improve water quality
Reynolds Street/US Route 1 Storm Water Improvements	TEA2-010	N. Kingstown	2006	Storm water enhancements to improve water quality
Factory Pond/Route 1 Runoff	ENHR-015	S. Kingstown	2003	Storm water enhancements to improve water quality
Route 107 Streetscape (on-road bike accommodations)	TEA2-028	Burrillville	2006	Alternative transportation
Stillhouse Cove Enhancements (shoreline pedestrian walkway)	TEA2-100	Cranston	2006	Alternative transportation along corridor of restored salt marsh and area where BMPs have been implemented
Lonsdale Village	TEAC-103	Cumberland	2003	Planting street trees in sidewalks
King Street Improvements	TEAC-060	East Greenwich	2003	Planting street trees in sidewalks
Main Street Improvements	TEA2-047	East Greenwich	2004	Planting street trees in sidewalks
Veteran's Memorial Parkway Enhancements	TEA2-129	East Providence	2006	Control access to Watchemocket Cove
Roger Williams Bike path	TEAC-083	Providence	2006	Alternative Transportation
Hamlet Avenue	TEAC-115/TEA2-040	Woonsocket	2003	Planting street trees in sidewalks
Statewide Bicycle/Pedestrian Program	TEA2-058	Statewide	2003	Alternative transportation
Tiverton Bike Route Extension	TEAC-119	Tiverton	2006	Alternative transportation
Tiverton Sakonnet River Bikeway	ENHR-027	Tiverton	2005	Alternative transportation
Blackstone Valley Bikeway Trailhead	TEA2-041	Woonsocket	2006	Alternative transportation

Storm Water Retrofit Program

The following section is excerpted from the Rhode Island Statewide Planning Transportation Improvement Program document dated October 1, 2002 to September 30, 2004.

"RIDOT has utilized a stakeholders group to prioritize the Storm Water Retrofit Abatement selection process. This stakeholders group includes the Rhode Island Department of Environmental Management, Federal Environmental Protection Agency, Save The Bay, community representatives from Cranston, Warwick, and

West Warwick as well as representatives from the Pawtuxet River Authority. It was mutually agreed that RIDOT would proceed with the design and construction of five outfalls on the Pawtuxet River as a first priority. To date, one contract addressing three outfalls has been designed and is presently under construction/completed. The other two outfalls on the Pawtuxet River are presently under design and will be bid for construction in Fiscal Year (FY) 2003. A Design Study Report for the remaining 15 outfalls from the original University of Rhode Island study has been prepared. This report will be shared with the stakeholders in order to decide the priority of the next five outfalls for which design efforts will begin.”

RIDOT will continue to advance storm water abatement components that are prioritized by the RIDEM. Future elements for incorporation into RIDOT’s program will include recommendations from federally approved TMDL studies that are prioritized by the RIDEM. The Department will procure additional consultant services through an RFP process during FY 2003. These consultant services should be in place to begin design efforts on additional storm water projects beginning in FY 2004. RIDOT has procured consulting services for additional retrofit projects for a total of 14 outfalls to be modified. Five are currently under construction.

Success of Measure

The measurable goals for each BMP were selected based on maximizing the use and effectiveness of RIDOT resources. In many cases, the Storm Water Committee felt that continuing existing programs was the best use of resources available, especially considering the funding and personnel allocations. The Committee felt that expanding the programs was important, however difficult.

The responsible party for monitoring and documenting each BMP is indicated below. Each entity will be responsible for tracking the success of each measure for inclusion in the Annual Report. Success will be determined on the basis of whether the measurable goal for each BMP was met. In instances where RIDOT is assisting for clean up events, the number of volunteers and the amount of material collected will be documented. Effectiveness of training will be determined by the number of personnel attending each training session.

Cost of Measure

At the present time it is difficult to estimate the actual costs for each of the proposed measures. For those practices that are currently part of the storm water management program for RIDOT, it will be included in the existing annual budget requests. For those measures that are new, it will first be required to evaluate the increased costs for implementation and then evaluate if an existing departmental budget can handle the new procedures/tasks. If it is deemed that additional funds are required beyond that which may reasonably be requested in annual budgets, additional evaluations for funding sources will need to be completed.



Best Management Practices – Implementation Plan

RIDOT will implement the following BMPs to achieve compliance with the requirements of **Measure 2**:

2A) Adopt a Highway/Spot. Provide Bags, Litter Picks, and Signage

<i>Responsible Party:</i>	Maintenance Section
<i>Target Audience:</i>	The Public, commercial and industrial businesses, trade associations, environmental groups and educational organizations
<i>Target Pollutant Sources:</i>	Litter
<i>Description:</i>	Provide trash bags, litter picks and Signage
<i>Measurable Goals:</i>	Year 2: Continue on-going program and document the number of adopted areas.

2B) Partner with URI Cooperative Extension to Develop Public Outreach Program

<i>Responsible Party:</i>	Environmental and Intermodal Planning
<i>Target Audience:</i>	The Public, state and municipal officials, environmental groups and educational organizations
<i>Target Pollutant Sources:</i>	Various
<i>Description:</i>	Public outreach program developed jointly between RIDOT and other interested groups, and funded by RIDOT. Details provided in Attachment C.
<i>Measurable Goals:</i>	Execute Memorandum Of Agreement in Year 2. See Attachment C.

2C) Fund Clean Up Efforts

<i>Responsible Party:</i>	Maintenance Section
<i>Target Audience:</i>	The Public, neighborhood associations, environmental groups and educational organizations
<i>Target Pollutant Sources:</i>	Litter, bulky/solid waste
<i>Description:</i>	Fund clean up efforts – prison cleanup crews; Woonasquatucket River clean up
<i>Measurable Goals:</i>	Year 2: Continue to fund and manage existing program. Document number of groups completing cleanups through RIDOT.

2D) RIDOT Internal Training

<i>Responsible Party:</i>	Environmental and Intermodal Planning/Maintenance Section
<i>Target Audience:</i>	RIDOT personnel
<i>Target Pollutant Sources:</i>	Any/all potential storm water pollutants
<i>Description:</i>	RIDOT personnel attend winter training sessions each year. Training includes erosion control and source reduction.
<i>Measurable Goals:</i>	Year 2-5: Existing on-going program. Document the number of personnel attending training sessions.

2E) Enhancement Program Projects

<i>Responsible Party:</i>	Design Office/Environmental and Intermodal Planning
<i>Target Audience:</i>	The Public, neighborhood associations and environmental groups
<i>Target Pollutant Sources:</i>	Sediment, hydrocarbons, airborne contaminants
<i>Description:</i>	Projects funded with enhancement, CMAQ or other sources, that address environmental quality (e.g. storm water retrofit, etc.).
<i>Measurable Goals:</i>	Year 2: Continue on-going program. Document the number of projects funded under this initiative.

Measure 3 - Illicit Discharge Detection and Elimination



Permit Requirement

At a minimum, the operator must develop, implement and enforce a program to detect and eliminate illicit discharges or flows into the small MS4. The management program must include a storm sewer system map showing the location of all outfalls and the names of all waters that receive discharges from those outfalls. A strategy for mapping additional elements such as, location of catch basins, manholes, pipes within the system, must be completed for those portions of the system that are associated with the investigation and tracing of illicit discharges detected from the dry weather survey of outfalls, identification of physical interconnections with other regulated MS4s, municipal construction activity projects, and catch basin inspections.

The General Permit requires that to the extent allowable under State law, RIDOT must prohibit and enforce, through an ordinance or other regulatory mechanism available to the operator, un-authorized non storm water discharges into the system. RIDOT does not have the authority to establish such an ordinance.

The illicit discharge plan must contain procedures to identify and initially target priority areas, locate illicit discharges, locate the source of the discharge, remove illicit discharges, document actions, and evaluate impact on sewer system subsequent to the removal. RIDOT must inform public employees and users of the facility of hazards associated with illegal discharges and improper waste disposal.



Best Management Practices – Rationale Statement

Because of the size and complexity of RIDOT storm water management system, the Committee proposed to use a combination of summer interns and hired vendors to identify, map and describe all storm water outfalls. The initial steps for the

identification of outfalls will be to obtain and review available construction or as-built plans for all areas within the Phase II regulated area. The Committee has decided that a watershed approach will be the most efficient method for prioritizing the identification of outfalls. Watershed groupings were identified based on the RIDEM 2002 303(d) List of Impaired Waters, and existing or planned TMDLs. Manageability of the size of each mapping area was also taken into consideration.

The mapping effort began in 2002 when RIDOT summer interns identified and GPS located all of the storm water outfalls in the Saugatucket River and Stafford Pond watersheds. In addition to physically locating the outfalls, the interns collected pertinent data regarding each outfall on a specially designed field report form. An example of the blank form is provided at Attachment B, as well as copies of all completed forms. Photo documentation was also collected. In 2003, RIDOT interns identified, located and documented the majority of outfalls within the Blackstone River watershed, with the exception of those outfalls located adjacent to limited access highways, where it would be necessary to have a traffic detail accompany the interns.

Based on the large area that needs to be covered, the Committee decided that in order to complete the mapping by the third year, as specified in the General Permit, RIDOT would need to hire a consultant vendor to complete the mapping. RIDOT is in the process of developing a scope of work for a Request for Proposals to hire a vendor. The scope of work will include GPS location and documentation, inspection of outfalls for dry weather flows, and sampling of dry weather flows.

In order to organize and manage the data in a manner that will facilitate evaluation, and tracking of illicit discharges, the Committee determined that RIDOT would need to create a spatial database of the outfall information. Personnel from RIDOT GIS office are in the process of evaluating various software platforms for managing and accessing the data. Currently the data are accessed through ArcMap. Once a management system is selected, data collected thus far by RIDOT interns will be input into the software system. Data collected by the vendor under contract to RIDOT will be provided to RIDOT in digital format to facilitate inclusion in the database.

Identification of existing connections to the RIDOT storm water system will be accomplished through a variety of methods. Currently, the interns are reviewing any available design plans and using these plans as a basis for field locating outfalls. Often design plans are not available so outfalls are located by finding catch basins in the field and then following them to their discharge location. Once an outfall is located documentation of outfall condition is completed. It is anticipated that the consultant will be responsible for dry weather sampling.

Based on the results of the dry weather flow surveys and sampling, it may be necessary to trace flows up the pipe to identify the connection point. Various methods of tracing are available, including smoke or dye testing, or video. It is

anticipated that location of “additional elements” will be accomplished during this effort, most likely by a contractor. Other additional elements will be identified via a strict as-built program, where resident construction engineers would be required to document any deviations to the construction plans and submit the revised plans to the design office and GIS office for inclusion in the system map and database.

Success of Measure

The measurable goals for each BMP were selected based on maximizing the use and effectiveness of RIDOT resources, while striving to meet the deadlines specified in the General Permit. Based in the size and complexity of the area to be covered by the mapping and illicit discharge detection program, the Committee felt that this Minimum Measure would be the most challenging to design and the most demanding to complete.

The responsible party for monitoring and documenting each BMP is indicated below. Each entity will be responsible for tracking the success of each measure for inclusion in the Annual report. Success will be determined on the basis of whether the measurable goal for each BMP was met. It is anticipated that during the preparation of each annual report, the Committee will review the progress made on each BMP, and evaluate the success/failure of the method employed to meet the goal. It is likely the Committee may find that a different or revised approach may be necessary to meet the desired goal. Any changes to the proposed methods will be described in each annual report.

Cost of Measure

At the present time it is difficult to estimate the actual costs for each of the proposed measures. For those practices that are currently part of the storm water management program for RIDOT, it will be included in the existing annual budget requests. For those measures that are new, it will first be required to evaluate the increased costs for implementation and then evaluate if an existing departmental budget can handle the new procedures/tasks. If it is deemed that additional funds are required beyond that which may reasonably be requested in annual budgets, additional evaluations for funding sources will need to be completed.



Legal Authority

RIDOT does not have the legal authority to establish a law or ordinance banning dumping or discharging wastes. To the extent possible, RIDOT will discourage such discharges, however, it is assumed that illegal, illicit discharges will be referred to RIDEM for enforcement action.



Best Management Practices – Implementation Plan

RIDOT will implement the following BMPs to achieve compliance with the requirements of **Measure 3**:

3Ai) Select Consultant/Vendor to Map Storm Water Outfalls and Create a Spatial Database for Structure Attributes, Maintenance and Asset Management

Responsible Party: Environmental and Intermodal Planning and GIS Office
Target Audience: N/A
Target Pollutant Sources: N/A
Description: RIDOT will hire a mapping vendor to finish mapping outfalls, create a database to store outfall information and interface with appropriate software. This vendor will also be responsible for sampling of dry weather outfalls once mapping of outfalls is complete.
Measurable Goals: Year 2: Hire consultant

3Aii) Woonasquatucket River, Moshassuck River Mapping

Responsible Party: Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Complete mapping of outfalls within Woonasquatucket and Moshassuck River Watersheds.
Measurable Goals: Year 2: Complete mapping.

3Aiii) Runnins River, Pawtuxet River (North Branch), Narragansett Bay (Upper)

Responsible Party: Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Complete mapping of outfalls within Runnins River, Pawtuxet River – North Branch, and Narragansett Bay – Upper Bay Watersheds.
Measurable Goals: Year 3: Complete mapping.

3Aiv) Pawtucket River (South Branch), Narragansett Bay (West Bay, Conanicut Island)

Responsible Party: Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Complete mapping of outfalls within Pawtuxet River – South Branch, Narragansett Bay - West Bay and Conanicut Island Watersheds.
Measurable Goals: Year 4: Complete mapping.

3Av) Narragansett Bay (East Bay, Aquidneck Island), Westport River

Responsible Party: Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Complete mapping of outfalls within Narragansett Bay – East Bay and Aquidneck Island, Westport River Watersheds.
Measurable Goals: Year 5: Complete mapping.

3Avi) Pawcatuck River, Thames River, Coastal

Responsible Party: Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Complete mapping of outfalls within Pawcatuck River, Thames River, Coastal Watersheds.
Measurable Goals: Year 5: Complete mapping.

3Avii) Saugatucket River, Stafford Pond and Blackstone River

Responsible Party: Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Outfall location data collection completed.
Measurable Goals: Completed.

3B) Create Spatial Database for Structure Attributes, Maintenance and Asset Management

Responsible Party: GIS Office
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Chosen consultant will create spatial data base for structural attributes, maintenance and asset management.
Measurable Goals: Year 2: Develop database with applicable parameters.

3Bi) Evaluate and Select Asset Management Software

Responsible Party: GIS Office
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Chosen consultant will work with RIDOT GIS Office to select preferred software.
Measurable Goals: Year 2: Select asset management software.

3Bii) Purchase and Install Software

Responsible Party: GIS Office
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Install software recommended by chosen mapping/database consultant.
Measurable Goals: Year 3: Rollout software.

3Biii) Select Area and Begin Pilot Project (Saugatucket River Watershed)

Responsible Party: GIS Office
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Enter field data collected for the Saugatucket River Watershed outfall mapping into recommended software.
Measurable Goals: Year 3: Enter field data previously collected.

3Biv) Complete Implementation – All Other Watersheds

Responsible Party: GIS Office
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Following pilot program, begin evaluating data collected in Year 3 mapping.
Measurable Goals: Year 3: Enter field data collected in subsequent years. Develop automated procedure for data entry.

3C) Develop Procedure for Recording Additional Elements

Responsible Party: Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Develop a design policy memo (DPM) detailing the procedure for locating additional elements (catch basins, man holes, etc.), recording pertinent information about them and amending mapping to depict these features.
Measurable Goals: Year 3: Develop policy memo by end of Year 3.

3Di) Drainage Discharges to System Accounted for through PAP System Drainage

Responsible Party: Design Office
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Drainage discharges to RIDOT system reviewed through the Physical Alteration Permit (PAP) process. Permitted drainage volumes are limited by an existing PAP regulations DPM that specifies no increases in drainage volumes discharging to the state system.
Measurable Goals: Year 2: Continue existing program.

3Dii) Adopt/Evaluate Design Policy Memo for New Connections/Discharges

Responsible Party: Design Office/ Environmental Office
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Draft new or revised policy for PAP policy /regulation regarding drainage connections to include geo-referencing to facilitate mapping of “additional elements”.
Measurable Goals: Year 3: New or revised policy for PAP policy/regulations drafted by end of Year 3.

3Diij) Identify Existing Connections/Discharges

Responsible Party: Maintenance Division
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Identify existing connections/discharges into RIDOT system through a limited review of PAP records for last three years and identification of significant contributors discharging to system.
Measurable Goals: Year 2: Review of PAP records and identify existing connections.

3Ei) Survey Outfalls – Blackstone, Woonasquatucket and Moshassuck River Watersheds

Responsible Party: Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Survey outfalls to identify dry weather flows.
Measurable Goals: Year 3: Survey outfalls – Blackstone, Woonasquatucket and Moshassuck River Watersheds.

3Eii) Survey Outfalls – Runnins River, Pawtuxet River (North Branch), Narragansett Bay (Upper Bay) Watersheds

Responsible Party: Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Survey outfalls to identify dry weather flows.
Measurable Goals: Year 4: Survey outfalls – Runnins River, Pawtuxet River (North Branch), Narragansett Bay (Upper Bay) Watersheds.

3Eiii) Survey Outfalls – Pawtuxet River (South Branch), Narragansett Bay (West Bay), Conanicut Island Watersheds

Responsible Party: Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Survey outfalls to identify dry weather flows.
Measurable Goals: Year 5: Survey outfalls – Pawtuxet River (South Branch), Narragansett Bay (West Bay), Conanicut Island Watersheds.

3Eiv) Survey Outfalls – Narragansett Bay (East Bay), Aquidneck Island and Westport River Watersheds

Responsible Party: Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Survey outfalls to identify dry weather flows.
Measurable Goals: Year 5: Survey outfalls – Narragansett Bay (East Bay), Aquidneck Island and Westport River Watersheds.

3Ev) Survey Outfalls – Pawcatuck River, Thames River, Coastal Watersheds

Responsible Party: Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Survey outfalls to identify dry weather flows.
Measurable Goals: Year 5: Survey outfalls – Pawcatuck River, Thames River, Coastal Watersheds.

3Fi) Sample Outfalls under Dry Weather Conditions

Responsible Party: Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: N/A
Description: RIDOT will sample mapped outfalls at Saugatucket River and Stafford Pond that have dry weather flows.
Measurable Goals: Year 2: Sample outfalls.

3Fii) Select Consultant/Vendor to sample Storm Water Outfalls with Dry Weather Flows

Responsible Party: Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: N/A
Description: RIDOT will select a consultant or vendor to sample mapped or located outfalls with dry weather flows.
Measurable Goals: Year 3: Hire vendor to sample storm water outfalls with dry weather flows.

3Fiii) Sample Storm Water Outfalls with Dry Weather Flows – Saugatucket River and Stafford Pond Watersheds

Responsible Party: Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: N/A
Description: The selected consultant/vendor will sample storm water outfalls identified with dry weather flows – Saugatucket River and Stafford Pond watersheds.
Measurable Goals: Year 3: Sample all storm water outfalls in these watersheds.

3Fiv) Sample Storm Water Outfalls with Dry Weather Flows – Blackstone, Woonasquatucket and Moshassuck River Watersheds

Responsible Party: Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: N/A
Description: The selected consultant/vendor will sample storm water outfalls identified with dry weather flows – Blackstone, Woonasquatucket and Moshassuck River watersheds.
Measurable Goals: Year 4: Sample storm water outfalls.

3Fv) Sample Storm Water Outfalls with Dry Weather Flows – Runnins River, Pawtuxet River (North Branch) and Narragansett Bay (Upper Bay) Watersheds

Responsible Party: Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: N/A
Description: The selected consultant/vendor will sample storm water outfalls identified with dry weather flows – Runnins River, Pawtuxet River (North Branch) and Narragansett Bay (Upper Bay) watersheds.
Measurable Goals: Year 4: Sample storm water outfalls.

3Fvi) Sample Storm Water Outfalls with Dry Weather Flows – Pawtuxet River (South Branch), Narragansett Bay (West Bay) and Conanicut Island Watersheds

Responsible Party: Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: N/A
Description: The selected consultant/vendor will sample storm water outfalls identified with dry weather flows – Pawtuxet River (South Branch), Narragansett Bay (West Bay) and Conanicut Island watersheds.
Measurable Goals: Year 5: Sample storm water outfalls.

3Fvii) Sample Storm Water Outfalls with Dry Weather Flows – Narragansett Bay (East Bay), Aquidneck Island and Westport River Watersheds

Responsible Party: Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: N/A
Description: The selected consultant/vendor will sample storm water outfalls identified with dry weather flows – Narragansett Bay (East Bay), Aquidneck Island, and Westport River watersheds.
Measurable Goals: Year 5: Sample storm water outfalls.

3Fviii) Sample Storm Water Outfalls with Dry Weather Flows – Pawcatuck River, Thames River, Coastal Watersheds

<i>Responsible Party:</i>	Environmental and Intermodal Planning
<i>Target Audience:</i>	N/A
<i>Target Pollutant Sources:</i>	N/A
<i>Description:</i>	The selected consultant/vendor will sample storm water outfalls identified with dry weather flows – Pawcatuck River, Thames River, Coastal watersheds.
<i>Measurable Goals:</i>	Year 5: Sample storm water outfalls.

Measure 4 – Construction Site Runoff Control



Permit Requirement

According to the General Permit, the operator of the regulated small MS4 must develop, implement, and enforce a program to reduce pollutants in any storm water runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one (1) acre. The operator must include disturbances less than one (1) acre if part of a larger common plan or if controlling such activities in a watershed is required by the Director. At a minimum, the program must be consistent with the requirements of the RIDEM RIPDES General Permit for Storm Water Discharge Associated with Construction Activity.

Since RIDOT implements all construction projects within RIDOT property, this permit requirement does not appear to apply directly to RIDOT activities, with the exception of certain enhancement projects that are undertaken by others, but funded by RIDOT.



Best Management Practices – Rationale Statement

Since RIDOT does not have the opportunity to regulate other entities performing construction projects within their property, the Committee decided to focus on improving construction site runoff control at RIDOT project sites. Discussions amongst the Committee identified failure of RIDOT or the contractors to perform regular inspection of construction site erosion and sedimentation controls, or inability of RIDOT to compel the contractor to maintain BMPs or respond to emergency situations due to the loosely written contracts and specifications. With that in mind, the Committee decided to focus attention to revising or creating standard specifications to require weekly or more frequent BMP inspections and stockpiling surplus BMPs at sites for emergencies.

An additional issue raised was the general lack of attention to preparing Storm Water Pollution Prevention Plans (SWPPPs) and facilitating compliance with SWPPPs due to confusion regarding responsibility and liability concerns. Proposed programs to address this breakdown include requesting the design engineer to prepare project specific site inspection checklists that would identify sensitive areas and specific permit requirements, continuing having an environmental specialist perform site inspections on a project specific basis as warranted, and holding storm water specific kick off meetings on certain projects as warranted to review the SWPPP, environmental permit conditions, inspection requirements and sensitive areas.

Finally, the Committee discussed a general disregard for or lack of enforcement of waste control requirements at construction sites. Methods discussed to address this concern included developing waste control training for RIDOT personnel and strengthening enforcement mechanisms to encourage the contractors to devote more attention to waste control.

Success of Measure

Measurable goals for each of the BMPs identified were selected based on the feasibility of implementing the program and available resources. In many cases, programs suggested by the Committee were abandoned because of impediments to adopting the program, or inability to adequately enforce the program.

Individual departments as identified below will be responsible for tracking the success of each measure. All actions taken will be recorded and reported in the Annual Report. For example, each field inspection will be recorded on a field inspection form and submitted to the Environmental and Intermodal Planning. The number of field inspections will be reported annually. The report will include an evaluation of the effectiveness of the selected BMPs. Should it be determined that the proposed program did not achieve the desired goal, the proposed methods may be re-evaluated and revised.

Cost of Measure

At the present time it is difficult to estimate the actual costs for each of the proposed measures. Costs associated with storm water BMPs currently part of RIDOT storm water management program will be included in existing annual budget requests. New storm water management BMPs will be evaluated to determine if an existing departmental budget can handle the new procedures/tasks. If it is deemed that additional funds are required beyond that which may reasonably be requested in annual budgets, additional evaluations for funding sources will need to be completed.



Best Management Practices – Implementation Plan

RIDOT will implement the following BMPs to achieve compliance with the requirements of **Measure 4**:

4A) Review and Revise RIDOT Standard Specifications (“Blue Book”) if needed to Create More Controls During Construction

Responsible Party: Design Office/ Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Draft an outline for a revised specification if needed to provide for more RIDOT control over contractor activities during construction.
Measurable Goals: Year 3: Develop outline for a revised specification if needed for use in Year 3.

4B) Modify Standard Specification - inspection

Responsible Party: Design Office/ Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: Sediment
Description: Modify standard specification to require inspection of erosion and sedimentation controls at a minimum of once per week and during or immediately after each storm, or once per week during periods of dry weather or minor storms.
Measurable Goals: Year 3: Revised standard specification available for use.

4C) Modify Standard Specification – on-site erosion and sediment control

Responsible Party: Design Office/ Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: Sediment
Description: Modify standard specification to require contractor to keep surplus erosion and sediment control materials on-site to facilitate maintenance or repair of damaged BMPs.
Measurable Goals: Year 3: Revised specification available for use.

4D) Inspection Schedule

Responsible Party: Design Office/ Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: Sediment
Description: Mandate BMP inspection schedule to be at least once per week by Wednesday of each week. To be completed by the contractor per the specification.
Measurable Goals: Year 3: Revised specification available for use.

4E) Revise WBS/DPM

Responsible Party: Design Office/ Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: Sediment
Description: Revise WBS/DPM to include project specific inspection checklist to be developed by the engineer during the design phase, identifying BMPs by station and sensitive areas to be inspected. Checklist to be used by designated RIDOT or contractor personnel.
Measurable Goals: Year 3: Revised WBS available for use.

4F) Inspection Program on Project Specific Basis

Responsible Party: Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: Sediment
Description: On a project specific basis, RIDOT will perform weekly or monthly inspections of construction projects, as appropriate.
Measurable Goals: Year 2: Continue existing program.

4G) Erosion and Sediment Control Inspection Techniques

Responsible Party: Environmental and Intermodal Planning
Target Audience: RIDOT personnel
Target Pollutant Sources: Sediment
Description: Erosion and sediment control inspection techniques provided at RIDOT winter training.
Measurable Goals: Year 2: Continue existing program.

4H) Standard Specification – Control Waste/disposal

Responsible Party: Design Office
Target Audience: Construction Contractor
Target Pollutant Sources: Litter
Description: Standard specification requires contractor to control waste at construction sites and dispose of properly.
Measurable Goals: Year 2: Continue existing program.

4I) Modify RIDOT Policy – SWPPPs Included in Construction Documents

Responsible Party: Design Office / Environmental and Intermodal Planning
Target Audience: Consultants
Target Pollutant Sources: Sediment, etc.
Description: Modify RIDOT policy to require preparation of SWPPPs for all projects to be included in Construction Documents (PS&E) prepared by consultant during design phase. Contractor to sign NOI form and share liability.
Measurable Goals: Year 3: Revised WBS and DPM available for use in first quarter of Year 3.

4J) Develop a Contract Enforcement Mechanism

Responsible Party: Construction Division/ Environmental and Intermodal Planning

Target Audience: Construction Contractors

Target Pollutant Sources: Sediment, litter

Description: Develop a contract enforcement mechanism for RIDOT to enforce BMPs relative to inspection, waste control, etc. as described in SWPPP.

Measurable Goals: Year 2-5: Outline of enforcement procedure available in Year 3.

4K) Develop or Contract for Waste Control Training

Responsible Party: Construction Division/ Environmental and Intermodal Planning

Target Audience: RIDOT Resident Engineers and Inspectors

Target Pollutant Sources: Litter

Description: Develop a training curriculum or contract with an education provider for waste control on job-site training.

Measurable Goals: Year 2-5: Training curriculum available for use in first quarter of Year 3.

4L) Implement Training Program

Responsible Party: Construction Division/ Environmental and Intermodal Planning

Target Audience: RIDOT Resident Engineers and Inspectors

Target Pollutant Sources: Litter

Description: Implement program developed under 4K.

Measurable Goals: Year 3-5: Training curriculum available for use in first quarter of Year 3.

4M) Meetings with Contractor Prior to Construction

Responsible Party: Environmental and Intermodal Planning

Target Audience: Contractors

Target Pollutant Sources: Sediment, waste, etc.

Description: Meetings with contractor prior to construction commencement to review environmental constraints and permit conditions. Pre-construction or field meetings.

Measurable Goals: Year 2: Procedure developed for conducting pre-construction environmental meetings.

4N) Pilot Program Kick-Off Meetings on Three Projects

<i>Responsible Party:</i>	Environmental and Intermodal Planning
<i>Target Audience:</i>	Construction contractors
<i>Target Pollutant Sources:</i>	Sediment, waste, etc.
<i>Description:</i>	Pre-construction environmental meetings held for three new projects.
<i>Measurable Goals:</i>	Year 3: Conduct environmental kick-off meetings for new projects as appropriate.

4O) Conduct Meetings at Project Kick-Off to 10 Projects

<i>Responsible Party:</i>	Environmental and Intermodal Planning
<i>Target Audience:</i>	Construction contractors
<i>Target Pollutant Sources:</i>	Sediment, waste, etc.
<i>Description:</i>	Conduct meetings at project kick-off for 10 projects. Projects would be selected based on Water Quality applicability.
<i>Measurable Goals:</i>	Year 4-5: Pre-construction environmental meetings held for 10 new projects each year.

Measure 5 - Post-Construction Runoff Control



Permit Requirement

According to the General Permit, the operator must develop, implement and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than or equal to one (1) acre, including projects less than one (1) acre that are part of a larger common plan of development or sale that discharge into the MS4. The program must ensure that controls are in place to prevent or minimize water quality impacts.



Best Management Practices – Rationale Statement

Since RIDOT does not allow outside entities to construct projects on RIDOT property, the Storm Water Committee decided that this Minimum Measure should focus of RIDOT projects and maintenance practices. Currently, all new projects planned by RIDOT are designed in accordance with the State of Rhode Island Stormwater Design and Installations Manual (RIDEM 1993). This manual provides guidance on the design, construction and maintenance of storm water management systems. At a minimum, storm water management systems for all new projects are designed to realize the maximum sediment retention possible, or at a minimum, 80 percent total suspended solids removal. Certain treatments systems achieve greater water quality efficiency, including but not limited to extended detention wet ponds and infiltration. Typically, due to right of way constraints, RIDOT is limited to

treatment options that occupy less space, such as Vortechs™ or other similar systems that meet the minimum requirements. For rehabilitation and reconstruction projects, RIDOT strives to provide the maximum water quality treatment possible given the site constraints.

Since existing programs are already in place on the design side, the Committee felt that RIDOT should focus on improving maintenance of structural BMPs. Through discussions with the maintenance division staff, it was discovered that the maintenance division does not have access to complete or current information regarding the location and proper maintenance of structural BMPs. Therefore, it was decided that proposed programs should focus on improving the level of documentation and information available to the maintenance division staff such that their maintenance work is facilitated.

Success of Measure

Measurable goals for each of the BMPs identified were selected based on feasibility of implementing the program and available resources. In many cases, programs suggested by the Committee were abandoned because of impediments to adopting the program.

Individual departments as identified below will be responsible for tracking the success of each measure. All actions taken will be recorded and reported in the Annual Report. The report will include an evaluation of the effectiveness of the selected BMPs. Should it be determined that the proposed program did not achieve the desired goal, the proposed methods may be re-evaluated and revised, or abandoned, as appropriate.

Cost of Measure

At the present time it is difficult to estimate the actual costs for each of the proposed measures. For those practices that are currently part of the storm water management program for RIDOT, they will be included in the existing annual budget requests. New storm water management BMPs will be evaluated to determine if an existing departmental budget can handle the new procedures/tasks. If it is deemed that additional funds are required beyond that which may reasonably be requested in annual budgets, additional evaluations for funding sources will need to be completed.



Legal Authority

RIDOT does not have the legal authority to establish a law or ordinance for the permitting of storm water discharges. However, since outside entities are not entitled to perform construction projects on RIDOT property, this mechanism does not appear to be warranted.



Best Management Practices – Implementation Plan

RIDOT will implement the following BMPs to achieve compliance with the requirements of **Measure 5**:

5A) RIDOT DPM – State Water Quality Standards

<i>Responsible Party:</i>	Design Office
<i>Target Audience:</i>	N/A
<i>Target Pollutant Sources:</i>	Sediment, hydrocarbons, metals, etc.
<i>Description:</i>	Current RIDOT DPM requires that all new construction meet the State Water Quality Standards for pollutant removal from storm water and redevelopment projects must incorporate retrofit actions to improve storm water quality to the maximum extent practicable.
<i>Measurable Goals:</i>	Year 2: Continue existing program.

5B) Snow Removal, Street Sweeping, Catch Basin Cleaning

<i>Responsible Party:</i>	Maintenance Division
<i>Target Audience:</i>	N/A
<i>Target Pollutant Sources:</i>	Sediment
<i>Description:</i>	Current maintenance practices include snow removal, street sweeping and catch basin cleaning. Work is completed on an as needed basis/as possible basis. Completion of work is dependent on available manpower.
<i>Measurable Goals:</i>	Year 2: Continue existing program.

5C) Location of Drainage Structures

<i>Responsible Party:</i>	Environmental and Intermodal Planning
<i>Target Audience:</i>	N/A
<i>Target Pollutant Sources:</i>	Sediment
<i>Description:</i>	RIDOT Maintenance Districts do not have information regarding the locations of all drainage structures. This limits the effectiveness of cleaning programs. Will be addressed in Measure 3C – location of “additional elements”.
<i>Measurable Goals:</i>	Year 3: Program in place.

5D) Final Acceptance of Construction Work

<i>Responsible Party:</i>	Maintenance Division
<i>Target Audience:</i>	N/A
<i>Target Pollutant Sources:</i>	Sediment, etc.
<i>Description:</i>	Maintenance personnel to be present at final inspection of construction work. This will facilitate understanding of drainage systems, and improve knowledge of system components.
<i>Measurable Goals:</i>	Year 3: Maintenance division personnel present at final inspection beginning third quarter of Year 3.

5Ei) Expanded As-Built Plan Requirements

<i>Responsible Party:</i>	Construction Section
<i>Target Audience:</i>	Contractors, consultants
<i>Target Pollutant Sources:</i>	N/A
<i>Description:</i>	Implement aggressive as-built plan requirement. As-built plans would be prepared based on Resident Engineer's project diary and made available to RIDOT staff, including maintenance through current plan file management system available on internal network. As-built plans depict the project as actually constructed. This will facilitate location and mapping of "additional elements" and maintenance.
<i>Measurable Goals:</i>	Year 3: Develop an as-built plan policy during Year 3.

5Eii) Implement As-Built Plan

<i>Responsible Party:</i>	Construction Section
<i>Target Audience:</i>	Contractors, consultants
<i>Target Pollutant Sources:</i>	N/A
<i>Description:</i>	Implement new as-built plan policy.
<i>Measurable Goals:</i>	Year 4: As feasible, implement new as-built plan policy during Year 4.

5Eiii) As-Built Plan Policy Evaluation

<i>Responsible Party:</i>	Chief Engineer
<i>Target Audience:</i>	Contractors, consultants
<i>Target Pollutant Sources:</i>	N/A
<i>Description:</i>	Evaluate effectiveness of policy, revise or abandon.
<i>Measurable Goals:</i>	Year 5: Evaluate effectiveness of policy during Year 5. Revise or abandon program as appropriate.

Measure 6 - Pollution Prevention/Good Housekeeping



Permit Requirement

The operator must:

- Identify all operations such as activities and facilities that have a point source or the potential for a point source discharge of storm water to an MS4 or waters of the State associated with activities or operations that have the potential to introduce pollutants to storm water runoff.
- Develop and implement a program to prevent and reduce pollutant runoff and runoff volumes from facilities owned and operated by the MS4 operator, and from the MS4 and structural BMPs. The program must include an employee training component.
- Develop and implement a program to prevent and reduce storm water pollution from operations and maintenance activities that have the potential to introduce pollutants to storm water runoff.
- Develop inspection procedures and schedules for long term operation and maintenance (O&M) of municipal facilities, municipal structural BMPs and the MS4.
- Develop and implement an employee training program for good housekeeping, pollution prevention, and O&M of BMPs.
- Implement a site-specific SWPPP developed for each facility that discharges storm water associated with industrial activity.



Best Management Practices – Rationale Statement

Due to the size and complexity of RIDOT facilities, it was decided by the Committee that SWMPPs for Maintenance Facilities and Satellite Offices would be developed separately. These SWMPPs were prepared to provide guidance for the operators of those facilities on good housekeeping measures for operations, and have been submitted under separate cover.

The following section describes programs identified by the Storm Water Committee to address O&M measures to be implemented by RIDOT to address pollution prevention. Due to budget and man power limitations, emphasis was placed on identifying existing programs that met the requirements of the General Permit. Where existing programs were found to fall short, the Committee reviewed various methods to improve pollution prevention while adhering to a realistic schedule and dedication of resources. Proposed programs will include source reduction initiatives such as more frequent sweeping and de-icing management programs, education of

RIDOT personnel, and location, inspection and maintenance of structural BMPs such as detention basins, swales and eroding road shoulders.

Recent changes to federal funding restrictions will allow for the use of federal funding sources for maintenance activities rather than construction projects alone. It is anticipated that this will allow for greater maintenance budgets which in turn may result in hiring additional personnel and purchasing more equipment. Due to these recent changes, there has been a shift in focus from construction to asset management, and RIDOT is currently investigating various systems for inventorying their infrastructure, recording maintenance requirements, and strategizing for future maintenance and funding.

Success of Measure

Measurable goals for each of the BMPs identified were selected based of feasibility of implementing the program and available resources. In many cases, programs suggested by the Committee were abandoned because of impediments to adopting the program.

Individual departments as identified below will be responsible for tracking the success of each measure. All actions taken will be recorded and reported in the Annual Report. The report will include an evaluation of the effectiveness of the selected BMPs. Should it be determined that the proposed program did not achieve the desired goal, the proposed methods may be re-evaluated and revised, or abandoned, as appropriate.

Cost of Measure

At the present time it is difficult to estimate the actual costs for each of the proposed measures. For those practices that are currently part of the storm water management program for RIDOT, it will be included in the existing annual budget requests. New storm water management BMPs will be evaluated to determine if an existing departmental budget can handle the new procedures/tasks. If it is deemed that additional funds are required beyond that which may reasonably be requested in annual budgets, additional evaluations for funding sources will need to be completed.



Best Management Practices – Implementation Plan

RIDOT will implement the following BMPs to achieve compliance with the requirements of **Measure 6**:

6A) Signage In Low Salt Area

Responsible Party: Maintenance Division
Target Audience: RIDOT & Town personnel, Public
Target Pollutant Sources: Road salt
Description: RIDOT currently provides signage in areas where surface waters are present nearby the roadway identifying these areas as "low salt" areas.
Measurable Goals: Year 2: Continue existing program.

6B) De-icing Heavily Traveled Roadways and Interstates

Responsible Party: Maintenance Division
Target Audience: RIDOT Personnel
Target Pollutant Sources: Sediment
Description: RIDOT uses straight salt for de-icing on interstates and heavily traveled roadways. The use of salt only reduces sedimentation and clean up requirements of sand applications.
Measurable Goals: Year 2: Continue existing program.

6Bi) Investigate Developing a Deicing Management Program

Responsible Party: Maintenance Division
Target Audience: RIDOT Personnel
Target Pollutant Sources: Road salt
Description: Investigate methods and equipment needed for a de-icing management program by end of year 5.
Measurable Goals: Year 2-5: Investigate program development.

6C) Winter Training

Responsible Party: Environmental and Intermodal Planning
Target Audience: RIDOT Personnel
Target Pollutant Sources: Any/all potential storm water pollutants
Description: RIDOT personnel attend winter training sessions each year. Training includes erosion control and source reduction.
Measurable Goals: Year 2: Continue existing program.

6D) Develop Storm Water Training Program

Responsible Party: Environmental and Intermodal Planning
Target Audience: RIDOT Personnel
Target Pollutant Sources: Any/all potential storm water pollutants
Description: RIDOT will incorporate storm water specific training into the annual training.
Measurable Goals: Year 2: Storm water training curriculum complete by end of Year 2.

6E) Implement Storm Water Training

<i>Responsible Party:</i>	Environmental and Intermodal Planning
<i>Target Audience:</i>	RIDOT Personnel
<i>Target Pollutant Sources:</i>	Any/all potential storm water pollutants
<i>Description:</i>	Implement storm water training.
<i>Measurable Goals:</i>	Year 2: Storm water training curriculum included in annual training

6G) Rental Equipment to Clean Water Quality Units

<i>Responsible Party:</i>	Maintenance Division
<i>Target Audience:</i>	N/A
<i>Target Pollutant Sources:</i>	Sediment
<i>Description:</i>	Rent equipment for cleaning water quality units or subcontract the cleaning.
<i>Measurable Goals:</i>	Year 3: Cleaning equipment rented, used and evaluated. Decision made on future cleaning practices by end of second quarter of Year 3.

6H) Implement Water Quality Unit Cleaning Program

<i>Responsible Party:</i>	Maintenance Division
<i>Target Audience:</i>	N/A
<i>Target Pollutant Sources:</i>	Sediment
<i>Description:</i>	Water Quality unit cleaning program implemented, all units to be inspected once annually and cleaned in accordance with manufacturer's specifications, as appropriate.
<i>Measurable Goals:</i>	Year 3: Water Quality unit cleaning program in use beginning in third quarter of Year 3.

6I) Standard Operating Procedures for Swales

<i>Responsible Party:</i>	Maintenance Division/ Environmental and Intermodal Planning
<i>Target Audience:</i>	N/A
<i>Target Pollutant Sources:</i>	Sediment
<i>Description:</i>	Roadside swales are difficult to clean due to rip rap, etc, and often lead to sediment plumes at the toe of slope that are difficult to access with equipment. Develop a standard operating procedure for maintenance of swales while minimizing disturbance to sensitive areas.
<i>Measurable Goals:</i>	Year 3: Develop standard operating procedure by first quarter of Year 3.

6J) Implement Standard Operating Procedure

Responsible Party: Maintenance Division/ Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: Sediment
Description: Implement SOP for maintenance of swales.
Measurable Goals: Year 3: Standard operating practice in use beginning third quarter of Year 3.

6K) Catch Basins Cleaned – Northwest Division, Newport Division

Responsible Party: Maintenance Division/ Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: Sediment
Description: Northwest maintenance division - all catch basins cleaned within last three years. Newport maintenance division - all catch basins cleaned within last two years.
Measurable Goals: Year 2: Continue existing program.

6L) Catch Basin Annual Cleaning - Statewide

Responsible Party: Maintenance Division/ Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: Sediment
Description: 600 catch basins will be cleaned annually state-wide as man power is available. Priority will be established based on results of cleaning records.
Measurable Goals: Year 2-5: 600 catch basins cleaned each year.

6M) Inventory Existing Detention Basins

Responsible Party: Maintenance Division/ Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: Sediment
Description: Database of existing detention basin locations created.
Measurable Goals: Year 3: Database of detention basin locations by end of second quarter of Year 3.

6N) Develop Inspection, Maintenance, Mowing Protocol

Responsible Party: Maintenance Division/ Environmental and Intermodal Planning
Target Audience: N/A
Target Pollutant Sources: Various
Description: RIDOT will develop a detention basin inspection and maintenance protocol for ensuring proper function and maintenance of detention basins.
Measurable Goals: Year 3: Protocol available for use by second quarter of Year 3.

6Q) Implement Protocol

<i>Responsible Party:</i>	Maintenance Division/ Environmental and Intermodal Planning
<i>Target Audience:</i>	N/A
<i>Target Pollutant Sources:</i>	Various
<i>Description:</i>	Begin inspecting and maintaining detention basins.
<i>Measurable Goals:</i>	Years 3-5: Ten basins to be inspected annually beginning in the first quarter of Year 4 and cleaned as necessary.

6P) Develop SOP for Maintaining Drainage Structures in Wetlands

<i>Responsible Party:</i>	Environmental and Intermodal Planning
<i>Target Audience:</i>	RIDOT Personnel
<i>Target Pollutant Sources:</i>	Sediment
<i>Description:</i>	Frequently drainage outfalls are located at or in wetlands, especially in the case of the older structures. Currently, RIDOT does not maintain these structures because of concerns about potential impacts to wetlands. RIDOT will develop a standard operating procedure for maintaining drainage structures in wetlands.
<i>Measurable Goals:</i>	Year 3: SOP approved by RIDOT by end of Year 3.

6Q) Negotiate Memorandum of Agreement with RIDEM

<i>Responsible Party:</i>	Maintenance/ Environmental and Intermodal Planning
<i>Target Audience:</i>	N/A
<i>Target Pollutant Sources:</i>	Sediment
<i>Description:</i>	Negotiate Memorandum of Agreement with RIDEM for maintaining drainage structures in wetlands.
<i>Measurable Goals:</i>	Year 3: Begin negotiations during first quarter of Year 3.

6Ri) Develop Method for Tracking Inspection of Drainage Structures

<i>Responsible Party:</i>	Maintenance Division / GIS Office
<i>Target Audience:</i>	N/A
<i>Target Pollutant Sources:</i>	N/A
<i>Description:</i>	Currently, RIDOT Maintenance Division keeps records regarding work order requests for maintenance of the facilities. RIDOT will evaluate the current record keeping practices and investigate effectiveness, and potential for expanding the existing program to become more useful.
<i>Measurable Goals:</i>	Year 2: Evaluate current record keeping practices during Year 2.

6Rii) Conduct Needs Assessment

Responsible Party: Maintenance Division / GIS Office
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Currently, the Maintenance Division does not have sufficient software resources to efficiently maintain cleaning and inspection records or model data to identify problem areas. Consultant hired under Minimum Measure 3Ai (Mapping Outfalls and Creation of Database) will conduct a needs assessment regarding asset management software during Year 3.
Measurable Goals: Year 3: Conduct needs assessment.

6Riii) Evaluate Needs for Computer Hardware to Support Record Keeping and Inspection Effort

Responsible Party: Maintenance Division / GIS Office
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Currently, the Maintenance Division does not have sufficient computer hardware resources.
Measurable Goals: Year 3: Requisition new equipment during Year 3.

6Riv) Implement New Record Keeping Program

Responsible Party: Maintenance Division / GIS Office
Target Audience: N/A
Target Pollutant Sources: N/A
Description: Implement new record keeping and inspection programs including software and hardware.
Measurable Goals: Year 4: Implement new program.

6S) Develop a Procedure for Minimizing Erosion of Roadway Shoulders

Responsible Party: Maintenance/Design
Target Audience: N/A
Target Pollutant Sources: N/A
Description: RIDOT will develop a SOP to identify problem areas, investigate problem and incorporate repair into construction contracts.
Measurable Goals: Year 2: Develop program.

6T) Sweeping Completed Statewide

<i>Responsible Party:</i>	Maintenance Division
<i>Target Audience:</i>	N/A
<i>Target Pollutant Sources:</i>	Sediment
<i>Description:</i>	Currently, road sweeping is completed statewide on an annual basis. Work order program currently in use allows for response to complaints. The existing program will be expanded to track complaints and prioritize sweeping based on need.
<i>Measurable Goals:</i>	Year 2-5: Continue existing program and expand as feasible to track complaints.

6U) Investigate Feasibility of More Frequent Sweeping

<i>Responsible Party:</i>	Maintenance/ Environmental and Intermodal Planning
<i>Target Audience:</i>	N/A
<i>Target Pollutant Sources:</i>	Sediment
<i>Description:</i>	Currently, RIDOT has insufficient resources to conduct roadway sweeping more than once per year. RIDOT will conduct a feasibility assessment to evaluate whether additional equipment or manpower can be allocated for more frequent roadway sweeping.
<i>Measurable Goals:</i>	Year 3: Feasibility assessment completed in Year 3.

Cooperation with Interconnected MS4s

The operator must identify all physical interconnections with other MS4s within the first year of the program. If additional physical interconnections are identified in subsequent years they must be reported on an annual basis in accordance to Part IV.G of the General Permit. The operator must attempt to work cooperatively with other interconnected MS4s, whose discharge is determined to be a significant contributor of pollutants, to reduce the impact of the discharges.

Source Control

As mentioned above, RIDOT will investigate source control as a method of pollution prevention. Expanded funding may make it possible to employ more sweeping crews and procure additional maintenance equipment.

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Additional Requirements

The following additional requirements are addressed as part of this Plan.

Endangered Species Act

At this time, RIDOT has not identified any discharges to a critical habitat of a listed or proposed to be listed rare, threatened or endangered species. Upon completion of mapping of the remaining outfalls, or as impacts are identified during dry weather surveys or illicit discharge detection and elimination actions, RIDOT will determine if these newly identified illicit discharges or outfalls discharge to a critical habitat of a listed or proposed to be listed rare, threatened or endangered species. RIDOT will submit this new information to RIDEM in the Annual Report. If RIDEM determines that the newly identified discharge can not be authorized under the General Permit, RIDOT will submit an application for an individual RIPDES permit.

Screening for critical habitat of rare, threatened or endangered species is included in the early planning stages of all new RIDOT projects, therefore, all proposed new discharges or impacts will be avoided.

Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation And Management Act (PL 94-265, As Amended) provides for the designation and regulation of Essential Fish Habitat (EFH), in order to promote domestic, commercial and recreational fishing under sound conservation and management principles, and to promote the protection of EFH in the review of projects conducted under Federal permits, licenses, or other authorities that affect or have the potential to affect such habitat.

Screening for EFH is included in the early planning stages of all new RIDOT projects, therefore, all proposed new discharges or impacts to EFH will be avoided, minimized or mitigated to the maximum extent possible. RIDOT participates in monthly coordination meetings with the National Marine Fisheries Services (NMFS) to ensure that new projects are designed in compliance with NMFS guidance for EFH.

National Register of Historic Places Properties

Section 106 of the National Historic Preservation Act of 1966, as amended, and Section 4(f) of the National Environmental Policy Act, require that Federal agencies take into account the effects of federally funded projects on historic properties. The National Historic Preservation Act also requires that agencies afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on undertakings that have the potential to affect properties listed in, or determined eligible for listing in the National Register of Historic Places. Proposed actions must also include all possible planning to minimize harm to historic resources, including a thorough evaluation of all feasible and prudent alternatives to actions which affect inventoried historic resources.

Screening for Section 106 and 4(f) resources is conducted during the early planning stages of all RIDOT projects, therefore, all proposed new discharges having the potential to impact these resources will be avoided, minimized or mitigated to the maximum extent possible. RIDOT coordinates directly with the Rhode Island State Historic Preservation and Heritage Commission (RIHPHC) to ensure that projects are designed in compliance with Section 106 and 4(f) guidance. Mitigation is provided when impacts or negative affects can not be avoided. Such mitigation is defined in a Memorandum of Agreement between RIDOT and the RIHPHC on a project specific basis.

Discharges to Water Quality Impaired Waters

At this time, each individual discharge to water quality impaired waters has not been identified. Discharges to impaired waters will be identified through the storm water outfall mapping to be completed under Minimum Measure 3.

If the RIDEM designates the MS4 as a regulated small MS4 and notifies the MS4 operator that discharges from the MS4 require non-structural or structural storm water controls based on an approved TMDL or other water quality determination that identifies provisions for discharges that contribute to a violation of water quality standards or are significant contributors of pollutants to waters of the State:

- The operator must determine the land areas contributing to the discharges identified in the approved TMDL or other water quality determination by RIDEM (subwatershed boundaries as determined from USGS topographic maps or other appropriate means).
- The operator must ensure that the SWMPP addresses all contributing areas and addresses the impacts identified by RIDEM.
- The operator must provide the following information regarding progress towards meeting the provisions that includes:

- Identification of the discharge(s). Provide a tabular description of the discharges identified in the approved TMDL or other water quality determination by RIDEM that includes location (latitude/longitude), size and type of conveyance (e.g. 15" diameter concrete pipe), any existing discharge data (flow data and water quality monitoring data).
- A description of the TMDL provisions or provisions of other water quality determination specific to the discharge.
- A description of any BMP(s) that have been implemented or will be implemented to address the provisions and pollutant(s) of concern identified by RIDEM. The BMPs must be tailored to address the pollutant(s) of concern and findings of the TMDL or other water quality determination by RIDEM. The operator shall assess the six minimum control measure BMPs and additional controls currently being implemented or that will be implemented in the SWMPP and describe the rationale for the selection of controls. The rationale must include the location of the discharge(s), receiving waters, water quality classifications, shellfish growing areas, and any other relevant information that the municipality may have (e.g. land use).
- If additional structural storm water controls or measures are necessary to meet the provisions of an approved TMDL or other water quality determination by RIDEM, the operator of the MS4 must also prepare and submit a Scope of Work (SOW) document describing the process and rationale that will be used to select BMPs and measurable goals to ensure that the TMDL provisions or other provisions identified by RIDEM will be met. The SOW document must:
 - Document how all remaining discharges within the contributing area not identified in the approved TMDL or other water quality determination by RIDEM, or system mapping, will be identified and assessed.
 - Document how the drainage or sub-catchment area(s) from discharge(s) identified in the approved TMDL or other water quality determination by RIDEM will be determined. Include sub-catchment area(s) from remaining discharges within contributing area that have not been identified in the approved TMDL or other water quality determination by RIDEM.
 - Document the process that will be used to identify interconnections within the system as well as how the permittee will work cooperatively with operators/owners of the interconnected system.
 - As appropriate, identify any structural BMPs that address the pollutants of concern, areas to site potential BMPs, permitting requirements or restrictions, potential costs, preliminary and final engineering requirements or the steps taken to determine this information if not known.
- The operator must provide measurable goals for the development and/or implementation of the six minimum measures and additional structural and non-structural BMPs that will be necessary to address provisions for the control of storm water in the provisions identified by RIDEM.
- Development and implementation of any amendments made to the six minimum control measures within regulated areas and/or development and implementation of the six minimum control measures to contributing areas that

were previously not regulated, must begin at the time of submittal of the NOI/SWMPP or revised SWMPP.

- Development and implementation of storm water control measures from the MS4 that are additional to the six minimum control measures must be started upon receipt of written approval from RIDEM based on a review of the SOW and implementation schedule.
- If the operator of an unregulated MS4 has not previously submitted a SWMPP, the operator of the MS4 must submit an NOI and SWMPP including amended BMPs, measurable goals, and the SOW if applicable, within one hundred and eighty (180) days of notification from RIDEM in accordance to the schedules of Part I.C.2 of the General Permit, and address the TMDL provisions or other provisions of a water quality determination identified by RIDEM as described in Part IV.D of the General Permit to obtain authorization for discharges previously not authorized. If the operator has previously submitted a SWMPP and has been authorized to discharge, the operator must submit only an amended SWMPP and the SOW, if applicable, to maintain authorization or to obtain authorization for discharges previously not authorized.
- Upon approval, the SOW document will be considered a part of the SWMPP and is subject to the Program Evaluation requirements of Part IV. E., the Record Keeping requirements of Part IV. F., the Reporting requirements of Part IV. G., and all other applicable requirements of the General Permit.



Water Quality Impaired Waters within the RIDOT MS4

Based on an evaluation of the area of RIDOT facility subject to the Phase II regulation and the current 303(d) List of Impaired Waters, RIDOT has identified the following impaired waterbodies within the regulated area.

Table 2 Water Quality Impaired Waters Crossing Rhode Island Department of Transportation Maintained Roads

Name	RIDEM Waterbody ID	State Highway Crossing or Storm Water Discharge Source	Group	Pollutants of Concern
Kickimuit River	RI0007033E-01A	Route 103	2	Pathogens
Kickimuit Reservoir (Warren Reservoir)	RI0007034L-01	Route 103, Schoolhouse Road	1	Excess algal growth/CHL-A, Phosphorus, pathogens, turbidity, taste and odor
North Easton Pond (Green End Pond)	RI0007035L-03	Route 214	4	Biodiversity impacts, excess algal growth/CHL-A
Lawton Valley Reservoir	RI0007035L-06	Route 114	4	Biodiversity impacts
Bailey's Brook	RI0007035R-01	Route 214, Route 138	2	Biodiversity impacts
Lawton Brook	RI0007035R-04	Route 114, Union Street	2	Biodiversity impacts
Jamestown Brook	RI0007036R-01	Route 138	2	Pathogens, biodiversity impacts, Iron (Fe), Lead (Pb)
Tidal Pawcatuck River	RI0008038E-01A	Route 78	1	Low DO, Pathogens
Tidal Pawcatuck River	RI0008038E-01B	Route 78	1	Pathogens
Pawcatuck River	RI0008039R-18D	Route 3	2	Biodiversity impacts
Pawtuxet River South Branch	RI0006016R-06B	Route 117, 33	2	Lead (Pb)
			3	Cadmium (Cd)
Moswansicut Stream	RI0006015R-16	Hopkins Road	2	Pathogens
Pawtuxet River North Branch	RI0006066R-06B	Route 1A, 1, 37 and 95	2	Lead (Pb)
			3	Cadmium (Cd)
Three Ponds	RI0006017L-02	Airport Access, Route 95	2	Copper (Cu), Lead (Pb), Phosphorus, Low DO
			4	Pathogens
Roger Williams Park Ponds	RI0006017L-05	Route 1	2	Pathogens, Low DO, excess algal growth/CHL-A, phosphorus

Table 2 Water Quality Impaired Waters Crossing Rhode Island Department of Transportation Maintained Roads (Continued)

Name	RIDEM Waterbody ID	State Highway Crossing or Storm Water Discharge Source	Group	Pollutants of Concern
Mashapaug Pond	RI0006017L-06	Route 2	1	Phosphorus, Low DO, excess algal growth/CHL-A, pathogens
Spectacle Pond	RI0006017L-07	Route 10	2	Phosphorus, excess algal growth/CHL-A
Sand Pond (N. of Airport)	RI0006017L-09	Route 1	2	Phosphorus, Low DO
Meshanticut Brook	RI0006017R-02	Route 295	3	Lead (Pb), Copper (Cu)
Pawtuxet River Main Stem	RI0006017R-03	Route 37, 117	5	Low DO, biodiversity impacts, lead (Pb), nutrients
Three Pond Brook	RI0006077R-04	Route 95	2	Lead (Pb)
Pocasset River	RI0006018R-03	Route 14	2	Lead (Pb), Pathogens
Simmons Brook	RI0006018R-04	Route 295	4	Pathogens
Turner Reservoir	RI0004009L-01A	Route 152	2	Low DO, Phosphorus, Lead (Pb), Copper (Cu)
			4	Pathogens
Turner Reservoir	RI0004009L-01B	Route 152	2	Low DO, Phosphorus, Lead (Pb), Copper (Cu)
			4	Pathogens
Ten Mile River	RI0004009R-01A	Route 15	2	Lead (Pb), Copper (Cu), Cadmium (Cd)
Ten Mile River	RI0004009R-01B	Route 114A, Route 1A/114, Route 152	2	Biodiversity impacts, Copper (Cu), Lead (Pb)
Woonasquatucket River	RI0002007R-10B	Stillwater Road, Esmond Street, Route 104	1	Copper (Cu), Lead (Pb), Pathogens, Cadmium (Cd)
			2	Mercury (Hg)
Woonasquatucket River	RI0002007R-10C	Route 104, Route 44, Greenville Ave., Manton Ave.	1	Cadmium (Cd), Pathogens, Lead (Pb), Copper (Cu)
			2	Mercury (Hg), PCBs, Dioxins

Table 2 Water Quality Impaired Waters Crossing Rhode Island Department of Transportation Maintained Roads

Name	RIDEM Waterbody ID	State Highway Crossing or Storm Water Discharge Source	Group	Pollutants of Concern
			5	Excess algal growth/CHL-A, Low DO
Woonasquatucket River	RI0002007R-10D	Route 6, Route 6A, Valley St., Atwells Ave., Manton Ave., Eagle St., Kinsley St., Route 10, Route 95, Francis St., Memorial Blvd.	1	Cadmium (Cd), Pathogens, Lead (Pb), Copper (Cu)
			2	Mercury (Hg), PCBs, Biodiversity impacts, Dioxins
			5	Pathogens
Nine Foot Brook	RI0002007R-11	Route 44	2	Biodiversity impacts
Slatersville Reservoir	RI0001002L-09	Route 5, Main Street	2	Copper (Cu), Lead (Pb)
			4	Pathogens, Phosphorus
Branch River	RI0001002R-01B	Route 146, Route 146A	2	Biodiversity impacts, Lead (Pb), Pathogens
Clear River	RI0001002R-05D	Route 107, Main Street	2	Copper (Cu), Lead (Pb), Biodiversity impacts, Cadmium (Cd)
Tarkiln Brook	RI0001002R-13B	Route 7, Douglas Turnpike	5	Biodiversity impacts
Scott Pond	RI0001003L-01	Route 122	2	Low DO, excess algal growth/CHL-A, Phosphorus
Valley Falls Pond	RI0001003L-02	Route 122	1	Biodiversity impacts, Lead (Pb), Pathogens, excess algal growth/CHL-A, Low DO, Phosphorus
Blackstone River	RI0001003R-01A	Route 114, Route 123, Route 122, Cullen Hill Road, Route 116, Route 295, School St., Manville Hill Rd., Route 99, Route 126, Bernon St., Route 104, River St., Singleton St., St. Paul St.	1	Copper (Cu), Pathogens, Biodiversity impacts, Lead (Pb)
			5	Ammonia (unionized), Nutrients, Low DO
Blackstone River	RI0001003R-01B	Main Street	1	Lead (Pb), Pathogens, Copper (Cu), Biodiversity impacts
			5	Ammonia (unionized), nutrients, Low DO
Mill River	RI0001003R-03	Route 114	1	Lead (Pb)

Table 2 Water Quality Impaired Waters Crossing Rhode Island Department of Transportation Maintained Roads (Continued)

Name	RIDEM Waterbody ID	State Highway Crossing or Storm Water Discharge Source	Group	Pollutants of Concern
Peters River	RI0001003R-04	Route 114	1	Copper (Cu), Lead (Pb), Pathogens
Robin Hollow Pond	RI0001006L-04	Route 123	2	Total Coliform
Abbott Run Brook	RI0001006R-01	Route 123	2	Cadmium (Cd), Lead (Pb), Biodiversity impacts
Long Brook	RI0001006R-02	Route 120, Little Pond County Road	2	Pathogens
East Sneece Brook	RI0001006R-03	Route 102	2	Pathogens
Ash Swamp Brook	RI0001006R-04	Route 120	2	Pathogens
Sakonnet River	RI0010031E-01A	Route 138	1	Pathogens
The Cove, Island Park	RI0010031E-03B	Route 138	1	Pathogens
Point Judith Pond	RI0010043E-06C	Route 1	1	Pathogens
Point Judith Pond	RI0010043E-06D	Route 1	1	Pathogens
Point Judith Pond	RI0010043E-06H	Route 1	1	Pathogens
Point Judith Pond	RI0010043E-06K	Route 1	1	Pathogens
Pettaquamscutt River	RI0010044E-01A	Route 1	5	Pathogens
Pettaquamscutt River	RI0010044E-01B	Route 1	5	Pathogens
Crooked Brook	RI0010044R-03	Route 1A	5	Pathogens
Indian Run Book	RI0010045R-02	Route 108	1	Copper (Cu), Lead (Pb), Zinc (Zn), Pathogens
Mitchell Brook	RI0010045R-03A	Route 138	1	Pathogens
Mitchell Brook	RI0010045R-03B	Route 138	1	Pathogens
			5	Biodiversity impacts, Iron (Fe)
Rocky Brook	RI0010045R-04	Route 108	1	Pathogens

Table 2 Water Quality Impaired Waters Crossing Rhode Island Department of Transportation Maintained Roads (Continued)

Name	RIDEM Waterbody ID	State Highway Crossing or Storm Water Discharge Source	Group	Pollutants of Concern
Saugatucket River	RI0010045R-05B	Saugatucket Road, Route 108, Columbia St., Main St.	1	Pathogens
			5	Biodiversity Impacts, Iron (Fe)
Saugatucket River	RI00010045R-05C	Main St., Route 1	1	Pathogens
Barney Pond	RI0003008L-02	Route 126	2	Phosphorus
Moshassuck River	RI0003008R-01B	Route 146, Route 15	5	Pathogens
West River	RI0003008R-03B	Route 146, Route 15	2	Pathogens
West River	RI0003008R-03C	Route 146, Route 15	5	Pathogens
Seekonk River	RI0007019E-01	Route I-95	1	Nutrients, Low DO, excess algal growth/CHL-A
Providence River	RI0007020E-01A	Route I-95	1	Excess algal growth/CHL-A, Low DO, Nutrients
			3	Metals
			5	Pathogens
Providence River	RI0007020E-01B	Route I-95, Memorial Blvd., Route 195, Point Street	1	Low DO, Nutrients
			3	Metals
			5	Pathogens
Barrington River	RI0007021E-01A	Route 114, Massasoit Avenue	5	Pathogens
Runnins River	RI0007021R-01	Route 195, Route 6	2	Lead (Pb), Low DO, Biodiversity impacts
			5	Pathogens
Palmer River	RI0007022E-01A	Sowams Road	1	Low DO, Nutrients
			5	Pathogens
Upper Narragansett Bay	RI0007024E-01	Route 195	2	Low DO, Nutrients

Table 2 Water Quality Impaired Waters Crossing Rhode Island Department of Transportation Maintained Roads (Continued)

Name	RIDEM Waterbody ID	State Highway Crossing or Storm Water Discharge Source	Group	Pollutants of Concern
			5	Pathogens
Sandy Pond (S. of Airport) (Little Pond)	RI0007024L-01	Route 117A	2	Pathogens
Buckeye Brook	RI0007024R-01	Route 117A	2	Biodiversity impacts
Gorton Pond	RI0007025L-01	Route 5	2	Excess algal growth/CHL-A, Low DO, Phosphorus
Hardig Brook	RI0007025R-01	Route 117, Route 2	1	Pathogens
			2	Lead (Pb), Biodiversity impacts
Maskerchugg River	RI0007025R-03	Route 401, Route 95	2	Lead (Pb), Cadmium (Cd), Copper (Cu)
Tuscatucket Brook	RI0007025R-05	Route 117	1	Pathogens
Silver Creek	RI0007026R-01	Gooding Avenue	2	Biodiversity impacts
Wickford Harbor	RI0007027E-04B	Route 1A	2	Low DO
Frenchtown Brook	RI0007028R-01	Route 2, Route 4, Route 403	2	Pathogens
Fry Brook	RI0007028R-02	Route 2, Route 4	5	Pathogens
Hunt River	RI0007028R-03A	Route 2, Route 4, Route 402, Route 403	5	Pathogens
Hunt River	RI0007028R-03B	Route 2, Route 4, Route 402, Route 403	5	Pathogens
Sandhill Brook	RI0007028R-05	Route 1, Route 403	2	Pathogens
Scrabbletown Brook	RI0007028R-06	Route 2, Route 4	5	Pathogens
East Passage	RI0007029E-01C	Newport Bridge	5	Unknown toxicity

Category 1 TMDL Underway;

Category 2 TMDL Planned

Category 3 Dissolved Metals Data Needed

Category 4 Insufficient Data Available. These waters need further monitoring to determine if there are Water Quality Standard violations

Category 5 TMDL or Equivalent Control Action Developed.

Source: 2002 303(d) List of Impaired Waters, RIDEM 2003.

TMDLs have been established for discharges to several of these waterbodies as discussed in the following section, though many have not. RIDOT continues to evaluate water quality improvement opportunities on a state-wide basis each time a project is undertaken by RIDOT. Emphasis is always placed on reducing pollutant loads for target contaminants where possible. Where reduction is not always possible within the scope of the RIDOT project, the goal is to improve the water quality to the Maximum Extent Possible.

Discharges with Established Total Maximum Daily Loads

Several TMDLs have been developed for waterbodies within the state that identify RIDOT as a responsible party. These TMDLs were listed in a letter provided by RIDEM dated February 23, 2004 from Mr. Eric Beck to RIDOT. These TMDLs are described below.



Scrabbletown Brook TMDL

Scrabbletown Brook is a second order stream located within the Towns of East Greenwich and North Kingstown. The watershed is approximately 1,653 acres in size and drains several wetland areas. Measured fecal coliform concentrations have been found to exceed the state's water quality standards. The pollutant of concern is pathogens as indicated by fecal coliform. RIDEM has identified Scrabbletown Brook as a Class A waterway and impaired by pathogens for a length of approximately 3.2 miles.

RIDEM has identified four major sources of fecal coliform bacteria in the Scrabbletown Brook watershed. These include storm water runoff from highways and residential/commercial areas, pigeons roosting under the Route 4 overpass, resident waterfowl upstream of Station S_{Ce} and S_{Ch}, and domestic pets and wildlife. According to RIDEM, the largest dry weather source of bacteria comes from the roosting pigeons under the Route 4 overpass. The largest wet weather source of bacteria to the watershed is storm water runoff. Although the 'pigeon source' is considered significant by RIDEM during wet weather, storm water runoff has a greater cumulative impact in the watershed. RIDEM has provided recommendations for BMPs and responsible entities in the Scrabbletown Brook TMDL. The following section outlines those BMPs that RIDEM has recommended that RIDOT implement to reduce fecal coliform bacteria loads to the maximum extent practicable (MEP).

Stations SCe and SCh (Tributary to Scrabbletown Brook at Scrabbletown Road and Route 2, respectively)

Storm water runoff from Scrabbletown Road and Routes 2 and 4 was identified as a wet weather source of pollution. RIDEM recommends that RIDOT implement one or more structural BMPs to reduce fecal coliform loads from Routes 2 and 4 to the MEP.

Station SC01 (Scrabbletown Brook at Stony Lane)

It is evident from RIDEM investigations that the pigeons roosting under the Route 4 overpass at Stony Lane negatively impact the water quality in this section of Scrabbletown Brook. Therefore, any efforts to reduce or eliminate the numbers of roosting pigeons would appear to be justified. This would have the effect of decreasing both dry and wet weather bacteria contributions to the stream. RIDEM recommends that RIDOT retrofit the overpass with a pigeon deterrent BMP.

The second source of fecal coliform bacteria identified at station SC01 is untreated storm water runoff from Stony Lane and Route 2. RIDEM recommends that RIDOT implement one or more structural BMPs to reduce fecal coliform loads from Route 2 to the MEP.

Watershed-Wide Storm water Management Issues

According to the TMDL, urban storm water runoff from roads and residential/commercial land uses impacts water quality in several portions of the Scrabbletown Brook watershed. Therefore, it is important to address these issues on a watershed basis. RIDEM believes that the best way to accomplish this is by working with RIDOT and the Towns of East Greenwich and North Kingstown to highlight these concerns and support their storm water management planning, including the construction of BMPs where needed.

Road Runoff BMPs

RIDEM has highlighted possible locations in the Scrabbletown Brook watershed where storm water BMPs may be the most effectively applied by RIDOT to address road runoff. Scrabbletown Brook intersection with Routes 2 and 4 downstream of station SC01 and the Scrabbletown Brook tributary intersection with Routes 2 and 4 downstream of station SCh.

Other BMPs recommended for the Scrabbletown Brook watershed include the implementation of the pigeon deterrent BMP which should result in a complete removal of roosting pigeons from the Route 4 overpass at Stony Lane, effectively eliminating this source of fecal coliform bacteria to Scrabbletown Brook.



Fry Brook TMDL

Fry Brook is a third-order stream located entirely within the Town of East Greenwich, Rhode Island. The watershed is approximately 1,986 acres in size and drains several wetland areas. Fry Brook is located in the Hunt River watershed and has been determined to impact water quality in the Hunt River. As a result, the Fry Brook TMDL is an integral part of the overall Hunt River TMDL for fecal coliform. The pollutant of concern is pathogens, as indicted by fecal coliform. Measured fecal coliform concentrations have been found to exceed the state's water quality standards. As reported in the 2002 303(d) list, RIDEM has identified Fry Brook as a Class B waterway and impaired by pathogens for approximately 3.9 miles.

RIDEM has identified three major sources of fecal coliform bacteria in the Fry Brook watershed. These include: storm water runoff from Routes 2 and 4 and residential/commercial areas, a dairy farm, and resident waterfowl (geese) and other wildlife in the watershed. The largest dry weather source of bacteria comes from the dairy farm. The farm includes confined animal operations in which large quantities of manure are produced. Manure found in barnyards, pastures, feedlots, and uncontrolled manure storage areas is a significant source of bacteria to Fry Brook. In addition, cows are allowed access to all portions of Fry Brook on the dairy farm. Elevated levels of bacteria during dry weather are a direct result of this. The two largest wet weather sources of bacteria to the watershed are storm water runoff from roads and commercial areas, and the dairy farm. RIDEM has provided recommendations for BMPs and responsible entities in the Scrabbletown Brook TMDL. The following section outlines those BMPs that RIDEM has recommended that RIDOT implement to reduce fecal coliform bacteria loads to the MEP.

Station FRY02 (Fry Brook approximately 600 yards south of Fry's Corner)

Storm water runoff from both Route 2 and Middle Road (Fry Corner) was identified as a wet weather source of pollution. RIDEM recommends that RIDOT and the Town of East Greenwich delineate the catchment area draining to Fry Brook at Route 2 and Middle Road, especially those portions of the roadways that drain to the stream. RIDEM recommends one or more structural BMPs to attenuate storm water runoff from the Route 2 Middle Road intersection to the MEP. Structural BMPs for this area should be designed to promote the detention and infiltration of runoff.

Station FRY04 (Tributary of Fry Brook, known as North Stream, located off Route 2)

In addition to impacts from the dairy farm, storm water runoff from Route 2 was identified as a wet weather source of pollution. RIDEM recommends that RIDOT

implement a structural BMP to reduce fecal coliform loads from Route 2 to the MEP. Structural BMPs for this area should be designed to promote the detention and infiltration of runoff.

Station FRY05 (Tributary of Fry Brook, known as South Stream, located off Route 2)

In addition to impacts from the dairy farm, storm water runoff from Route 2 was identified as a wet weather source of pollution. RIDEM recommends that RIDOT implement a structural BMP to reduce fecal coliform loads from Route 2 to the MEP. Structural BMPs for this area should be designed to promote the detention and infiltration of runoff.

Station FRY03 (Fry Brook at downstream side of Route 4)

In addition to storm water impacts upstream at stations FRY02, FRY04 and FRY05, storm water runoff from Route 4, the parking lot of American Die Casting Corp., and On Semiconductor was identified as contributing to the elevated bacteria loads measured at station FRY03. Additionally a large, resident population of Canada geese is present in the FRY03 sub-watershed which RIDEM attributes as a contributing source of fecal coliform bacteria. BMP recommendations for stations FRY02, FRY04 and FRY05 were described above.

RIDEM recommends that RIDOT implement one or more structural BMPs to reduce fecal coliform loads from Route 4 to the MEP. Structural BMPs for this area should be designed to promote the detention and infiltration of runoff.

Watershed-Wide Storm Water Management Issues

Urban storm water runoff from roads and residential/commercial land uses impacts water quality in several portions of the Fry Brook watershed. Therefore, it is important to address these issues on a watershed basis. RIDEM believes that the best way to accomplish this is by working with RIDOT and the Town of East Greenwich to highlight these concerns and support their storm water management planning, including the construction of BMPs where needed.

Road Runoff BMPs

RIDEM has highlighted possible locations in the Fry Brook watershed where storm water BMPs may be the most effectively applied by RIDOT to address road runoff. Fry's Corner Route 2 downstream of station FRY02; west side of Route 4 near American Die Casting Corporation upstream of station FRY03; Route 2 downstream of station FRY04; and Route 2 downstream of station FRY05.



Hunt River TMDL

The Hunt River Basin is centrally located in Rhode Island on the westerly side of Narragansett Bay. The watershed drains approximately 25 square miles (15,445 acres) and includes parts of seven Rhode Island communities: Exeter, North Kingstown, East Greenwich, West Greenwich, Coventry, West Warwick, and Warwick. The watershed includes Hunt River, Potowomut River, and four major tributaries. The major tributary sub-watersheds are Sandhill Brook (2,352 acres), Frenchtown Brook (4,487 acres), Scrabbletown Brook (1,653 acres), and Fry Brook (1,986 acres). TMDLs have been developed for Scrabbletown Brook and Fry Brook and have been discussed previously. The Hunt River TMDL has been developed for fecal coliform, as measured fecal coliform concentrations in the river have been found to exceed the state water quality standards. Both dry and wet weather water quality data have been collected in the Hunt River watershed, revealing elevated fecal coliform concentrations at both instream and tributary stations.

As reported in the 2002 303(d) list, RIDEM has identified the Hunt River headwaters to Frenchtown Road (5.4 miles) as a Class A waterway and the Hunt River from Frenchtown Road to the Brown and Sharpe discharge point located approximately 0.55 miles downstream of Frenchtown Road as a Class B waterway (0.5 miles). Both the class A and B segments are listed as being impaired by pathogens. The majority of bacteria violations in the watershed were found to occur during wet weather conditions.

RIDEM has identified five major sources of fecal coliform bacteria in the Hunt River watershed. These include storm water runoff from highways and residential/commercial areas, a dairy farm, pigeons roosting under a Route 4 overpass, a horse farm, and resident waterfowl, domestic pets, and wildlife. The largest dry weather sources of bacteria are the dairy farm, pigeons roosting under a Route 4 overpass, and domestic pets, resident waterfowl, and other wildlife. The largest wet weather source of bacteria to the watershed is storm water runoff. Although other sources are significant during wet weather, RIDEM attributed storm water runoff as having a greater cumulative impact in the watershed. RIDEM has provided recommendations for BMPs and responsible entities in the Hunt River TMDL. The following section outlines those BMPs that RIDEM has recommended that RIDOT implement to reduce fecal coliform bacteria loads to the MEP.

Station HRe (Hunt River headwaters at Route 2)

Runoff draining from Route 2, South Road, and Tillinghast Road was observed by RIDEM representatives entering the stream channel unabated by pollution control measures. RIDEM recommends that RIDOT implement one or more structural BMPs to reduce wet weather fecal coliform loads from Route 2 to the MEP.

Station FB01 (Frenchtown Brook at Davisville Road)

Fecal coliform standards are not violated at this station during dry weather. Elevated bacteria concentrations during wet weather are thought to be primarily due to the large numbers of waterfowl found in the ponds draining to the brook, and to storm water runoff from Woodbridge Drive, Tillinghast Road, Frenchtown Road, and Route 2. RIDEM's recommendations address these two pollution sources. RIDEM recommends that RIDOT implement one or more structural BMPs to reduce wet weather fecal coliform loads from Route 2 to the MEP.

Station HR04 (Hunt River at Route 1)

Fecal coliform standards are not violated at this station during dry weather. Wet weather impairments in this section of the Hunt River are thought to be due to wet weather inputs from Fry Brook, as well as untreated storm water runoff from Route 1. The pollution reductions required for the Fry Brook watershed and the future BMPs discussed below should result in the achievement of water quality standards at station HR04. Currently, there is little or no treatment of storm water runoff from Route 1. However, work is underway by RIDOT to design a number of BMPs associated with improvements to Route 1 at the Frenchtown Road interchange. As part of the project, RIDOT has contracted with an engineering firm to design at least three storm water BMPs and two wetland restoration/creation areas. The wetland areas will be located on the north and south sides of the river near the Route 1 bridge and should provide flood control and habitat benefits. Since other wetland areas in the watershed have been shown to reduce fecal coliform concentrations, a reduction may be seen here as well.

The first storm water BMP is a series of detention basins that accepts runoff from the highway from the railroad bridge to the entrance to the shopping center – an area of 5.8 acres. Excess flows from the existing BMP in the adjacent Stop and Shop parking lot will be accepted as well. The second BMP drains about 19.0 acres from the railroad bridge to Bruester Drive. Runoff is conveyed to a detention basin for treatment and then discharged to a wetland area, which contributes flow to Sandhill Brook. The third BMP treats an area of about 4.3 acres and consists of a level spreader designed to provide sheet flow to an adjacent wetland. All of the BMPs are designed to treat runoff from a 10-year storm event. For detention basins, the designs provide additional storage volume, and thus improved treatment, for all storm frequencies. RIDEM anticipates that these new BMPs and wetland areas will result in a net reduction in wet weather pollutant loads, including pathogens, to both the Hunt River and Sandhill Brook.

Watershed-Wide Storm Water Management Issues

Urban storm water runoff from roads and residential/commercial land uses impacts water quality in several portions of the Hunt River watershed. Therefore, it is important to address these issues on a watershed basis. RIDEM believes that the best way to accomplish this is by working with RIDOT and the Towns of East Greenwich and North Kingstown since these are the towns where the impairments have been detected, to highlight their concerns and by supporting their storm water management planning, including the construction of BMPs where needed.

Road Runoff BMPs

RIDEM has highlighted possible locations in the Hunt River watershed where storm water BMPs may be the most effectively applied by RIDOT to address road runoff. Hunt River headwaters downstream of station HRe; Frenchtown Brook downstream of water quality stations FB01, FB01A, FB03, FBc; Pierce Brook (Separate TMDL planned) downstream of UB01; Sandhill Brook (Separate TMDL planned) downstream of water quality stations SB01, SB1, SB02, SB03; Hunt River mainstem downstream of water quality stations HR04, HR05.



Pettaquamscutt (Narrow) River TMDL

The Pettaquamscutt (Narrow) River is just over 9.5 kilometers long and runs parallel to the West Passage of Narragansett Bay in the southern portion of its watershed. The river is a composite of a tidal inlet and back bay, an estuary, and two ponds. The watershed includes slightly more than 36 square kilometers within the Towns of North Kingstown, Narragansett and South Kingstown in southern Rhode Island. The pollutant of concern is fecal coliform, a parameter used by RIDEM as an indicator of pathogen contamination. Three perennial and seven intermittent streams discharge to Narrow River. The principal tributaries to the river are Gilbert Stuart Stream, which discharges to Upper Pond at the northern extremity of the river, and Mumford and Crooked brooks that discharge to Pettaquamscutt Cove, near the southern extremity. The remaining regions of the river receive a majority of baseline freshwater inflow as groundwater seepage from the coastal margin.

As reported on the 2002 303(d) list, RIDEM has identified the Narrow River from the headwaters at the end of Gilbert Stuart Stream to the mouth of the river including Pettaquamscutt Cove as a Class SA waterway; the Narrow River waters in the vicinity of the marina at Middle Bridge as a Class SA{b} waterway; Gilbert Stuart Stream as a Class A waterway; and Crooked Brook as a Class A waterway. Both the Class SA and A segments are listed as being impaired by pathogens. The {b}

modifier indicates a partial use designation due to inputs from a concentration of vessels.

Narrow River's three largest tributaries, Mumford Brook, Gilbert Stuart Stream and Crooked Brook act as the principal pathways by which nonpoint loadings enter the Narrow River during periods of dry and wet weather. Gilbert Stuart Stream is the primary fecal coliform source to Upper Pond while Mumford Brook and Crooked Brook are the principal sources to southern Pettaquamscutt Cove. Birds also contribute significant fecal coliform loadings to the river. They are present throughout the Narrow River watershed, however, the largest waterfowl populations are consistently seen in the heavily developed residential area between Bridgetown Bridge and Middlebridge Bridge, and within the Pettaquamscutt Cove National Wildlife Refuge located in the southern portion of Pettaquamscutt Cove in Narragansett. Predictably, water quality impacts that appear attributable to birds are most evident in these areas. Bird-related fecal coliform loadings to the middle section of the river are estimated through a mass balance approach explained in detail in Chapter 5 of the TMDL. Loadings to Pettaquamscutt Cove from wildlife and waterfowl are not estimated because accurate population counts are unavailable, other significant sources are present and tidal action increases the complexity of any calculations.

All dry weather sources continue to contribute during wet weather conditions to a larger or lesser degree. However, wet weather sources of fecal coliform to the Narrow River attributed by RIDEM are dominated by storm water runoff entering the river through tributary channels, storm sewer outfalls, and overland as sheet flow. Storm sewer outfalls discharging to Segments 2, 3 and 4 of the River have a dramatic effect on water quality during runoff events. Fecal matter from domestic animals, wildlife, waterfowl and failing septic systems is deposited on lawns, parking lots, docks, streets and along the shoreline. It accumulates during dry periods and is subsequently washed off and efficiently transported to receiving waters through storm drains during rain events

Pollutant Contributions to Gilbert Stuart Stream

Although wildlife and storm water runoff may contribute significant fecal coliform loadings to the stream, human activity appears to be the dominant source. Since monitoring began in 1992, fecal coliform concentrations in Gilbert Stuart Stream have consistently been elevated. A failing septic system at the Gilbert Stuart Museum, located at the headwaters of the stream, was replaced around 1997, however concentrations in the stream remained elevated. During the 1999 sampling effort, the primary source of fecal coliform contamination to Gilbert Stuart Stream was localized to the Gilbert Stuart Museum property. A privy in close proximity to Carr Pond was identified as the likely source. With the ready cooperation of the museum curators, John and Deborah Thompson, the use of the privy was eliminated and replaced with

a portable toilet. Recent sampling indicates that the water quality in Gilbert Stuart Stream has improved markedly.

Pollutant Contributions to Mumford Brook

Fecal coliform concentrations in the brook are consistently the highest of any tributary in the watershed. Although wildlife and storm water runoff may contribute significant fecal coliform loadings to the brook, human activity again appears to be the dominant source. The highest concentrations in Mumford Brook have consistently been measured in close proximity to East Narragansett Avenue in South Kingstown. The consistent nature and extremely high concentrations noted during the RIDEM study were concluded by RIDEM to be from an anthropogenic source. Homes in the immediate vicinity rely on standard on-site disposal systems for wastewater treatment. Soils in the area are comprised of thin mantles of “high risk” well-draining gravel fill and glacial outwash or poorly draining glacial till over bed rock. Based on the monitoring data and the previously described conditions, it appears that one or more septic systems in the area may be discharging inadequately treated effluent to the brook.

RIDEM has identified MS4s discharging to the Narrow River as owned and operated by the Town of Narragansett, the Town of South Kingstown, and/or by RIDOT. Based on the latest census data, an area within the Town of Narragansett meets the criteria of a Densely Populated Area (DPA), including the portion of the Narrow River watershed south of Sprague Bridge. Accordingly, the Town of Narragansett will be required to apply for a RIPDES permit for that portion of their MS4 located within the DPA. The remaining Narragansett, South Kingstown and RIDOT storm sewer outfalls are part of MS4s that are not located in a DPA or Urbanized Area (UA). However, because they discharge significant loadings to an impaired waterbody (which is also a Special Resource Protection Water), because these loadings contribute to a violation of a water quality standard, and because it has been determined through this TMDL that storm water controls are necessary to restore water quality, the operators are required to obtain a RIPDES permit (or expand coverage of an existing permit).



Palmer River TMDL

The Palmer River lies in northeastern Rhode Island and southeastern Massachusetts. The upper fresh water reach of the River lies in the Town of Rehoboth. Smaller portions of the River extend into Seekonk, Attleboro, Swansea, Norton, Taunton, and Dighton. Significant areas of the watershed drain to Shad Factory Pond and Warren Upper Reservoir, which are water supply reservoirs for the Bristol County (RI) Water Authority (BCWA). The BCWA provides drinking water to the communities of Bristol, Warren and Barrington in Rhode Island.

As reported in the 2002 303(d) list, the water quality classification of the Palmer River is SA. The Palmer River from the MA-RI border to the East Bay Bike Path trestle in Warren, approximately 2,500 feet north of the confluence with the Barrington River is impaired for low dissolved oxygen, nutrients, and pathogens. This TMDL addresses the Rhode Island portion of the Palmer River from the state boundary to the East Bay Bicycle Path Bridge. The reach of the River from the Bike Path Bridge to its confluence with the Barrington River is assigned a water quality designation of SB1 and is not included in this TMDL.

The impaired reach of the Palmer River was divided into three segments. These include the upper Palmer River located entirely in Massachusetts, lower Palmer River and Belcher Cove. Additionally, sources in the Warren and Barrington Rivers, seaward of the Palmer River were also evaluated, as this is a tidal system. A detailed description of individual sources is presented in the TMDL report. A brief summary of pollutant sources by stream segment is presented below.

Pollutant Contributions to Upper Palmer River

The predominant sources of fecal coliform are located in the tributaries to the upper Palmer River in Massachusetts. These fecal coliform sources are the predominant contributors to the high bacterial concentrations downstream in the main body of the Palmer River. The highest bacterial concentrations observed in the upper Palmer River watershed during wet weather were associated with runoff from adjacent cropland, pasture, and dairy farms. Fecal matter from domestic animals, wildlife, waterfowl and failing septic systems may also be washed off forested areas, lawns, golf courses, and roadways into the Palmer River during rain events. RIDEM considers station 6A, located in the upper portion of the main body of the Palmer River to represent Massachusetts' sources to the Rhode Island portion of the Palmer River in both dry and wet weather.

Pollutant Contributions to Lower Palmer River

The lower Palmer River is influenced by sources upstream in the Palmer River, which include the upper Palmer River and Belcher Cove. Other sources along the banks of the Palmer River, including the large wetlands bordering either side of the river, were determined to be negligible in dry weather. The RIDEM Shoreline Survey sampled all sources including pipes and streams located along the shoreline of the Palmer and Warren Rivers in Rhode Island. The survey found three dry weather sources that may also be potential wet weather contributors to the system. The areas along the river may serve as sources during wet weather due to wash off of fecal matter from domestic animals, wildlife, waterfowl and failing septic systems. RIDEM has concluded that there are no significant sources in this area of the river other than sources in the headwaters and natural background inputs.

Pollutant Contributions to Belcher Cove

Two streams flow into Belcher Cove and contribute to the fecal coliform concentrations. These two streams, Belcher Stream East and Belcher Stream West have higher weighted geometric mean fecal coliform concentrations than station 6A in the upper Palmer River. The flow rates from these small streams are much lower, whereas station 6A is in the main body of the river where downstream flow and the total contribution of bacteria is much higher. Belcher Stream West has high bacteria concentrations in dry and wet weather due several pet waste problems and urban runoff from roadways and commercial properties. Belcher Stream East is problematic only in wet weather. The predominant source in this stream is a small cattle farm located upstream on the southern fork of the tributary. Other sources in this stream include wildlife, waterfowl, domestic animals and possible failing septic systems on the north fork of the stream.

RIDEM recommends that RIDOT install structural BMPs to reduce contribution of fecal coliform from roadways to Belcher Stream East at the crossings of Market Street, and with Belcher Stream West at the crossing with Child Street.

The MS4s that discharge to the Palmer River are owned and operated by the Towns of Barrington and Warren, or RIDOT. Areas within Rhode Island adjacent to the Palmer River, with the exception of the area along the eastern shore of Belcher Cove and the Palmer River are in a UA. Accordingly, the Towns of Barrington and Warren, and RIDOT are required to apply for RIPDES permits for those portions of their MS4s located within the UA. The Palmer River is designated as an SRPW in the state's Water Quality Regulations. As a result, any storm sewer outfalls that are part of MS4s that are not located in the UA found subsequent to this TMDL to discharge significant loadings to the Palmer River will be required to obtain a RIPDES permit (or expand coverage of an existing permit). This action is required by the Phase II regulations because these loadings contribute to a violation of a water quality standard, and because it has been determined through this TMDL that storm water controls are necessary to restore water quality.



Stafford Pond TMDL

Stafford Pond is a 487 acre reservoir with a watershed of approximately 947 acres in Tiverton, Rhode Island, which serves as a drinking water supply for both Tiverton and Portsmouth, Rhode Island. Over the past several years, the pond has experienced frequent algal blooms, leading to taste and odor problems, which prompted the Stone Bridge Fire District (SBFD) to upgrade its water treatment practices. As reported in the 2002 303(d) list, the water quality classification of Stafford Pond is Class A and it is impaired for excess algal growth, low dissolved oxygen and nutrients.

The TMDL documents that the primary problem affecting Stafford Pond is an overabundance of algae caused by elevated levels of phosphorus. In addition, the study found violations of water quality criteria for both dissolved oxygen and total phosphorus. RIDEM has provided recommendations for BMPs and responsible entities in the Stafford Pond TMDL. Two 18-inch storm drains empty into the southeast corner of Stafford Pond near the public boat ramp. These outfalls are the only direct discharges of storm water runoff to the pond. The northern storm drain pipe (sampling station SP8) drains sections of Old Stafford Road. The southern pipe (sampling station SP9) drains sections of Route 81 and discharges to a small wetland area within 200 feet of the pond. Sub-basin 2, which contains these two storm drain systems, delivers the second largest of the sub-basin loads, so it is an important source to control. RIDEM is presently working with RIDOT to support the implementation of storm water BMPs at both outfalls. In order to expedite the installation of these BMPs, RIDEM is working with RIDOT to add these two sites to a pre-existing design contract with an outside consultant. RIDEM is using funding from the Clean Water Act (CWA) Section 319 Nonpoint Source program to pay for the design and construction of these facilities. Due to the tight constraints on available land, RIDEM has directed the design engineer to focus on in-line BMPs, such as the 33 "Stormtreat" or "Vortech" type systems, rather than traditional detention or retention ponds.



Crooked Brook TMDL

The Crooked Brook watershed is located in Narragansett, Rhode Island. Crooked Brook is the third largest tributary to Narrow River discharging to Pettaquamscutt Cove at the southern end of the Narrow River estuary. The pollutant of concern is fecal coliform, a parameter used by Rhode Island as an indicator of pathogen contamination. As reported in the 2002 303(d) list, the water quality classification of Crooked Brook is Class A.

The MS4s that discharge to Crooked Brook are owned and operated by the Town of Narragansett or by RIDOT. Based on the latest census data, the Crooked Brook watershed is within the Narragansett DPA. Accordingly, the Town of Narragansett and/or RIDOT are required to apply for a RIPDES permit for their MS4s within the DPA.



Saugatucket River TMDL

The Saugatucket River Basin is south-centrally located in Rhode Island on the westerly side of Narragansett Bay. The watershed drains approximately 16.5 square miles (10,560 acres) and includes parts of four Rhode Island communities: Exeter, Narragansett, North Kingstown, and South Kingstown. The watershed includes the

Saugatucket River and its major tributaries, Indian Run Brook, Rocky Brook, and Mitchell Brook.

As reported in the 2002 303(d) list, Indian Run Brook is impaired for Copper (Cu), Lead (Pb), Zinc (Zn), and pathogens. Mitchell Brook is impaired for pathogens, biodiversity impacts and iron (Fe). Rocky Brook is impaired for pathogens. The Saugatucket River is impaired for pathogens, biodiversity impacts and iron (Fe). As reported in the 2002 303(d) list, the water quality classification of Indian Run Brook, Mitchell Brook, Rocky Brook and the Saugatucket River are Class B waterways. The Saugatucket River from the Main Street Dam in Wakefield to the Route 1 overpass is a Class SB water and is impaired for pathogens.

The Saugatucket River TMDL has been developed for fecal coliform, which has been found to exceed the state's water quality standards. Both dry and wet weather water quality data have been collected in the Saugatucket River watershed, revealing elevated fecal coliform concentrations at both instream and tributary stations. Based on this data, Saugatucket River, Indian Run Brook, Rocky Brook, and Mitchell Brook were placed on the state's 303(d) List of Impaired Waterbodies.

RIDEM has identified the major sources of fecal coliform bacteria in the Saugatucket River watershed. These include storm water runoff from highways and residential/commercial areas, a cow farm, pigeons roosting under the Palisades Industries Complex and the Main Street bridge, resident waterfowl, domestic pets, and wildlife. The largest dry weather sources of bacteria are the cow farm, pigeons roosting under the Palisades and Main Street Bridge, resident waterfowl, and other wildlife. Cumulatively, the largest wet weather source of bacteria to the watershed is storm water runoff.

RIDEM has recommendations for BMPs and responsible entities in the Saugatucket River TMDL. The following sections outlines those BMPs that RIDEM has recommended that RIDOT implement to reduce fecal coliform bacteria loads to the MEP.

Pollutant Contributions to Segment 3 (Rocky Brook headwaters to Curtis Corner Road)

A combination of structural and non-structural control measures are recommended by RIDEM for this reach. Non-structural control measures include more frequent street cleaning, storm drain maintenance, a pet-waste ordinance, and ISDS maintenance. Additionally, this TMDL calls for the Town of South Kingstown, RIDOT, and responsible property owners to reduce wet weather fecal coliform loads to the maximum extent technically feasible through the use of structural BMPs that promote the detention and/or infiltration of runoff from roadways and commercial properties within the catchment area and/or at the outfall located off Greenwood Drive. More specifically, RIDEM has suggested that there appears to be adequate

space within the storm sewer right-of-way off Greenwood Drive (Station RB9) to construct an infiltration basin to detain and/or reduce the volume of water that reaches the stream as runoff.

**Pollutant Contributions to Segment 1 (Rocky Brook
Reservoir outlet to Rocky Brook mouth at Railroad St.)**

A combination of structural and non-structural control measures are recommended for this segment. Non-structural control measures include more frequent street cleaning, storm drain maintenance, and a pet-waste ordinance. ISDS maintenance is not recommended since this segment of the watershed is sewered. Additionally, this TMDL calls for the Town of South Kingstown, RIDOT and responsible property owners to reduce wet weather fecal coliform loads to the maximum extent technically feasible through the use of structural BMPs that promote the detention and/or infiltration of runoff from roadways and commercial or industrial properties within the catchment areas and/or the outfalls at the following locations: the Kingstown Road storm water swale below Rocky Brook Reservoir (Station RB5U), Kingstown Road at Anton's Deli, and Railroad Street.

**Pollutant Contributions to Segment 1 (Indian Run Brook at
Indian Run Reservoir Outlet to Peace Dale Guild)**

A combination of structural and non-structural control measures are recommended for this segment. Non-structural control measures include more frequent street cleaning, storm drain maintenance, a pet-waste ordinance, and ISDS maintenance. Additionally, this TMDLs calls for the Town of South Kingstown, RIDOT, and responsible property owners to reduce wet weather fecal coliform loads to the maximum extent technically feasible through the use of structural BMPs that promote the detention and/or infiltration of runoff from roads and commercial properties within the 102 acre catchment area and/or the outfall that drains the Dale Carlia Corner intersection and Old Tower Hill Road, and discharges to the box culvert located at the intersection of Route 108, School Street and Indian Run Road.

**Pollutant Contributions to Segment 1 (Saugatucket River
from Church Street Bridge to the Main Street Dam)**

A combination of structural and non-structural control measures are recommended for this segment. Non-structural control measures include more frequent street cleaning, storm sewer maintenance, and a pet-waste ordinance. ISDS maintenance is not recommended since this segment of the watershed is sewered. Reductions in upstream fecal coliform concentrations associated with Indian Run Brook, Rocky Brook, and the Palisades Industrial Complex are expected to reduce concentrations in this segment. However, RIDEM also recommends that RIDOT retrofit the Main Street

bridge with pigeon deterrents to discourage pigeons from roosting underneath the bridge over the river.

Storm Sewer Discharges

Storm water runoff is the largest wet weather source of bacteria to the Saugatucket River and its tributaries. Storm sewers magnify the problem by rapidly collecting, concentrating and directly routing polluted runoff to receiving waters. They supply the majority of the fecal coliform load to the river during wet weather. Consistent with the goals of this TMDL, outfalls are targeted for water quality best management practices to mitigate pollutant loadings to the maximum extent technically feasible.

According to the TMDL, “end-of-pipe” structural BMPs designed to treat current flows and pollutant loadings at the storm sewer outfalls would necessarily be rather expensive and/or require substantial land area. RIDEM suggests that a multi-faceted storm water management strategy be incorporated by the Town of South Kingstown and RIDOT that utilizes a combination of end-of-pipe structural BMPs, smaller-scale structural retention/infiltration BMPs located up-gradient within the catchment areas, and the implementation of nonstructural BMPs throughout the watershed.

The MS4s that discharge to the Saugatucket River are owned and operated by the Town of South Kingstown, or by RIDOT. As noted in the RIPDES Regulations, year 2000 census data shows that portions of the Saugatucket River watershed in the villages of Wakefield and Peace Dale meet the criteria of a UA or a DPA.

Accordingly, the Town of South Kingstown will be required to apply for a RIPDES permit for portions of their MS4s located within the appropriate UA or DPA by March 10, 2003. The remaining South Kingstown and RIDOT storm sewer outfalls within the watershed are part of MS4s that are not located in a UA or DPA. However, because they discharge significant loadings to an impaired waterbody (which is also a SRPW), because these loadings contribute to a violation of a water quality standard, and because it has been determined through this TMDL that storm water controls are necessary to restore water quality, the operators will be required to obtain a RIPDES permit (or expand coverage of an existing permit). These areas include MS4s that drain to Mitchell Brook and the portion of Indian Run Brook upstream of Saugatucket Road.



Runnins River TMDL

The Runnins River lies in a 10.2 square mile (6,545 acres) watershed within the Warren River Basin. The watershed contains portions of the City of East Providence in Rhode Island and the Towns of Rehoboth and Seekonk Massachusetts. At its mouth the Runnins River flows over the Mobil Dam to form the Barrington River, a tributary estuary to Narragansett Bay. The TMDL addresses the Class B water of the Runnins River from the County Street Bridge at the Rhode Island/Massachusetts

border where the river enters the state, to the Mobil Dam. The Rhode Island portion of the Runnins River is designated as a Class B water in the RIDEM Water Quality Regulations.

The pollutant of concern is fecal coliform, used by Rhode Island as an indicator of pathogen contamination. RIDEM identified one significant dry weather source, elevated fecal coliform concentrations were attributed to pigeons roosting under the Route 195 Bridge overpass. RIDEM identified four significant wet weather sources below County Street, the Route 6 stream no. 2, the County Street Culvert, the Route 195 stream (pigeons under the Route 195 overpass), and Orange Juice Creek, which drains a large area of East Providence. RIDEM has additionally proposed a BMP for a fifth source in this reach, the Route 6 culvert, which routes storm water runoff to the river from Route 6 in East Providence. The following section outlines those BMPs that RIDEM has recommended that RIDOT implement to reduce fecal coliform bacteria loads to the MEP.

County Street Culvert

The County Street Culvert was identified as the second largest wet weather source of fecal coliform to the Runnins River. RIDOT has preliminary plans for a storm water BMP to remove sediments. Plans have been made with RIDOT and RIDEM for RIDOT to further sample the storm drain system once the pigeon deterrent structure is in place. The City of East Providence will also be mapping the County Street storm drain system and inspecting for illicit connections as part of a Supplemental Environmental Project (SEP).

Route 195 Stream

Under a RIDOT contract, a pigeon deterrent BMP is currently being designed to prevent pigeons from nesting under the Route 195 Bridge. The Route 195 Stream was the sole identified dry weather source and the third largest wet weather contributor of fecal coliform to the Runnins River. This BMP may also reduce loadings at County Street because runoff from the bridge does flow to the County Street drain.

Route 6 Culvert

A storm water BMP is currently being designed under a RIDOT contract, to remove sediments from a culvert draining the area along Route 6 in East Providence next to the river.

Orange Juice Creek

Primary contribution of coliform bacteria to Orange Juice Creek stemmed from periodic overflows of partially treated sewage and rain water from the Wannimoisett Road Pumping Station, as well from a manhole on the corner of Boyd Avenue and Howland Avenue in East Providence. On December 29, 1998, a Notice of Violation (NOV) was issued to the City of East Providence for these discharges (NOVCI1342). The RIDEM identified the need for storm water BMPs to be implemented by RIDOT under the Phase II Storm Water Program.

The Fecal Coliform TMDL report was prepared by the RIDEM Office of Water Resources in August 2002 for the Runnins River. This report states that the river “is impaired primarily by non-point sources. No permitted point sources discharge to the Runnins River.” The study attributed the elevated levels of fecal coliform to pigeons roosting under the Route 195 bridge overpass, with failing septic systems as an additional potential source. RIDOT has since developed a program for washing bridges statewide on a regular basis to remove wastes associated with pigeons. RIDOT is also installing a Vortech water quality unit at the Waterman Avenue/Warren Avenue outfall to the Runnins River.



Barrington River TMDL

The Barrington River watershed lies in northeastern Rhode Island and southeastern Massachusetts and includes the estuarine waters of the Barrington River and One-Hundred Acre Cove. The Barrington River TMDL addresses the Class SA waters of the Barrington River from the Mobil Dam to the Bike Path Bridge. The River violates the Class SA water quality standard for fecal coliform and the river has been closed to shell fishing since 1998. The entire river fails to meet water quality standards in wet weather. The Runnins River, due to its proximity to the Barrington River, its discharge volume, and its source strength constitutes the principal influence on fecal coliform conditions in the Barrington River. The Palmer River watershed is a source during wet weather.

The MS4s that discharge to the Barrington River are owned and operated by the Town of Barrington and RIDOT. RIDEM, CRMC, RIDOT and the Town of Barrington will work together to identify funding sources and to evaluate locations and designs for storm water control BMPs throughout the watershed.

RIDEM has recommendations for BMPs and responsible entities in the Barrington River TMDL. The following section outlines those BMPs that RIDEM has recommended that RIDOT implement to reduce fecal coliform bacteria loads to the MEP.

Woods Pond

RIDEM believes that the Town of Barrington and RIDOT should consider a structural BMP to pretreat storm water prior to discharge into Woods Pond. Woods Pond, located behind the Barrington Town Hall functions as a storm water treatment pond handling storm water runoff from Route 114 and Maple Avenue.

RIDEM Office of Water Resources prepared a TMDL for Fecal Coliform in August 2002 for the Barrington River. This report indicated that agricultural lands, and wildlife and waterfowl contribute to the elevated levels of fecal coliform in the river. The Runnins River discharges directly into the head of the Barrington River and is “the largest fecal coliform source to the Barrington River.” The majority of the Barrington River is located outside of East Providence. BMPs proposed for the Runnins River will serve to reduce fecal coliform levels entering the Barrington River.

Table 3 Summary of TMDLs, RIDOT Responsibilities, and RIDEM Recommended BMPs.

TMDL	Causes of Impairment	Locations specifically identified as RIDOT Responsibilities	RIDEM Recommended Abatement Measures
Scrabbletown Brook	Storm water runoff/ Storm sewer outfalls	Routes 2 and 4 at Stony Lane	Implement one or more structural storm water BMPs to MEP
	Pigeons roosting under Route 4 overpass	Route 4 overpass at Stony Lane	Install Pigeon Deterrent retrofit to the overpass
Fry Brook	Overland storm water runoff	Route 2 at Middle Road and Route 4	Implement one or more structural storm water BMPs to MEP
Hunt River	Storm water runoff/ Storm sewer outfalls	Route 2, South Road Tillinghast Road, Frenchtown Road and Route 1 at Frenchtown Road	Implement one or more structural storm water BMPs to MEP
	Pigeons roosting under Route 4 overpass	Route 4 overpass	Install Pigeon Deterrent retrofit to the overpass
Pettaquamscutt (Narrow) River	Storm sewer outfalls	Bridgetown Road	Implement one or more structural storm water BMPs to MEP
Palmer River	Storm water runoff	Market Street at Belcher Stream East and Child Stream at Belcher Stream West	Implement one or more structural storm water BMPs to MEP
	Storm sewer outfalls		Implement one or more structural storm water BMPs to MEP
Stafford Pond	Storm water outfalls	Route 81 and Old Stafford Road	Implement on-line structural storm water BMPs to MEP
Crooked Brook	Storm sewer outfalls	Kingstown Road, South Pier Road outfall	Implement one or more structural storm water BMPs to MEP
Saugatucket River	Storm sewer outfalls	Outfall located off Greenwood Drive, the Kingstown Road storm water swale below Rocky Brook Reservoir, Kingstown Road at Anton's Deli, and Railroad Street, intersection of Route 108, School Street and Indian Run Road	Implement one or more structural storm water BMPs to MEP
	Pigeons roosting under the Main Street Bridge	Main Street Bridge	Install Pigeon Deterrent retrofit to the bridge

Table 3 Summary of TMDLs, RIDOT Responsibilities, and RIDEM Recommended BMPs (cont.)

TMDL	Causes of Impairment	Locations specifically identified as RIDOT Responsibilities	RIDEM Recommended Abatement Measures
Runnins River	Storm sewer outfalls	County Street Culvert	RIDOT has preliminary plans for a storm water BMP
	Storm sewer outfalls	Route 6 culvert in East Providence	A storm water BMP is currently being designed under a RIDOT contract
	Pigeons roosting under the Route 195 overpass	Route 195 overpass	Under a RIDOT contract a pigeon deterrent BMP is currently being designed
Barrington River	Storm sewer outfalls	Woods Pond	Implement one or more structural storm water BMPs to MEP

Source: Rhode Island Department of Environmental Management, 2004.

TMDL Action Summary

Though it appears questionable that RIDOT facilities may be contributing significant pollutant or storm water inputs to some of these waterbodies (e.g. Crooked Brook), RIDOT will endeavor to implement the requested BMPs. RIDOT has a state-wide pigeon abatement program in place that allows for retro-fitting bridges with netting or other structures to discourage pigeon roosting under bridges. New bridge structures such as the proposed new I-195 Providence River Bridge have been designed to eliminate the types of surfaces that pigeons typically roost on.

The previously mentioned state-wide Storm Water Retrofit Initiative is providing water quality improvement for runoff from existing RIDOT facilities. Sites are selected based on contaminants of concern, available right of way width, and anticipated BMP effectiveness. Several of these projects have been completed to date and are visible in the vicinity of the I-95/ Route 113 intersection.

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Evaluation and Assessment

Program Evaluation Requirements

- The operator must annually evaluate the compliance of the SWMPP with the conditions of this permit. If the permittee is required to implement, requirements for the control of Storm Water identified in an approved TMDL, the operator must identify compliance with the approved scope of work and schedules. If the schedules are not being met, the operator must provide an explanation as well as an amended schedule. If any or all of the Storm Water control measures have been implemented, assess whether the Storm Water control measures are being met or if additional measures are necessary.
- The operator annually must evaluate the appropriateness of the selected BMPs and efforts towards achieving the Measurable Goals. The SWMPP may be changed in accordance with the following provisions:
 - Changes adding (but not subtracting or replacing) components, controls or requirements to the SWMPP may be made at any time upon written notification to RIDEM.
 - Changes replacing an ineffective or infeasible six minimum control measure BMP, specifically identified in the SWMPP, with an alternative BMP may be requested at any time. Unless denied, changes proposed in accordance with the criteria below shall be deemed approved and may be implemented sixty (60) days from submittal of the request. If the request is denied, the Director shall send a written explanation of the denial. Changes replacing an ineffective or infeasible storm water control specifically identified in the SWMPP or in an approved Scope of Work document to meet the requirements of an approved TMDL, may be requested at any time, however, written approval from RIDEM must be received prior to implementing changes.
 - Modification requests, must include the following information:
 - Analysis of why the BMP is ineffective or not feasible (e.g., cost prohibitive).
 - Expectations on the effectiveness of the replacement BMP.
 - Analysis of how the replacement BMP is expected to achieve the goals of the BMP to be replaced.
 - Change requests or notifications must be in writing and signed in accordance with the signatory requirements of Part V. of this permit.
- The Director may require changes to the SWMPP as needed to:

- Meet the minimum requirements of Part IV of this permit.
- Address impacts on receiving water quality caused or contributed by discharges from the MS4.
- Include more stringent requirements necessary to comply with new Federal statutory or regulatory requirements.
- Include such other conditions deemed necessary to comply with the goals and requirements of the CWA.
- Include a revised scope of work and implementation schedule necessary to comply with the TMDL requirements.

Any changes requested by the Director shall be in writing and shall set forth the time schedule for the operator to develop the changes and amend the SWMPP and to offer the opportunity to propose alternative program changes to meet the objective of the requested modification.

Record Keeping

RIDOT is required to keep records of all activities performed in accordance with the Storm Water Management Plan, such as public education and participation programs, illicit discharge detection progress, construction and post construction programs, and pollution prevention programs. RIDOT must keep all records for a minimum of five years, submit copies of records to RIDEM if required, and make the records relating to this permit available to the public, including the SWMPP.

Reporting

RIDOT must submit a report to RIDEM each year containing the following information:

- A self assessment review of compliance with the permit conditions.
- Assessment of the appropriateness of the selected BMPs.
- Assessment of the progress towards achieving the measurable goals.
- Assessment of the progress towards meeting the requirements for the control of Storm Water identified in an approved TMDL.
- Summary of results of any information that has been collected and analyzed. This includes any type of data.
- Discussion of activities to be carried out during the next reporting cycle.
- A discussion of any proposed changes in identified BMPs or measurable goals.
- Date of annual notice and a copy of the public notice.
- Summary of public comments received in the public comment period of the draft annual report and planned responses or changes to the program.
- Planned municipal construction projects and opportunities to incorporate water quality BMPs, low impact development as well as activities to promote infiltration and recharge.

- Newly identified physical interconnections with other small MS4s.
- Coordination of activities planned with physically interconnected MS4s.
- Summary of the extent of the MS4 system mapped, actions taken to detect and address illicit discharges including: the number of illicit discharges detected, illicit discharge violations issued, and violations that have been resolved. Number and summary of all enforcement actions referred to RIDEM.
- Summary of the number of site inspections conducted for erosion and sediment controls, inspections that have resulted in an enforcement action, and violations that have been resolved. Number and summary of all enforcement actions referred to RIDEM.
- Summary of the number of site inspections conducted for proper installation of post construction structural BMPs, inspections that have resulted in an enforcement action, and violations that have been resolved. Number and summary of all enforcement actions referred to RIDEM.
- Summary of the number of site inspections conducted for proper operation and maintenance of post construction structural BMPs, inspections that have resulted in an enforcement action, and violations that have been resolved.
- Reference any reliance on another entity for achieving any measurable goal.

Reports to RIDEM must be submitted at the following address:

R.I. Department of Environmental Management
Office of Water Resources
RIPDES Program
235 Promenade Street
Providence, RI 02908

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References

- RIDEM 1989. Soil Erosion and Sediment Control Handbook.
- RIDEM 1993. Stormwater Design and Installations Manual.
- RIDEM 1997. Water Quality Regulations.
- RIDEM 1998. Total Maximum Daily Load for Total Phosphorus Loads to Stafford Pond, Final.
- RIDEM 2001. Fecal Coliform TMDL Development For Fry Brook, Rhode Island, Final Report.
- RIDEM 2001. Fecal Coliform TMDL Development for Hunt River, Rhode Island, Final Report.
- RIDEM 2001. Fecal Coliform TMDL Development for Scrabbletown Brook, Rhode Island, Final Report.
- RIDEM 2001. Fecal Coliform TMDL for the Pettaquamscutt (Narrow) River Watershed, Rhode Island.
- RIDEM 2002. Fecal Coliform TMDL Development for Barrington River, Rhode Island.
- RIDEM 2002. Fecal Coliform TMDL for Palmer River, Rhode Island.
- RIDEM 2002. Fecal Coliform TMDL for the Runnins River, Rhode Island.
- RIDEM 2003. Fecal Coliform TMDL for Crooked Brook, Rhode Island (Waterbody ID Number RI0010044R-03).
- RIDEM 2003. Final Pathogen TMDL for Saugatucket River, Mitchell Brook, Rocky Brook and Indian Run Brook.
- RIDEM 2003. General Permit Rhode Island Pollutant Discharge Elimination System Storm Water Discharge from Small Municipal Separate Storm Sewer Systems and from Industrial Activity at Eligible Facilities Operated by Regulated Small MS4s (RIR14000).
- RIDEM 2003. Regulations For The Rhode Island Pollutant Discharge Elimination System.
- RIDEM 2003. State Of Rhode Island 2002 303(D) List, List of Impaired Waters, Final.

Attachments

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- Attachment A: 5-Year Outline
 - Attachment B: Outfall Mapping Information
 - Attachment C: University of Rhode Island Cooperative Extension Partnership for Public Outreach and Participation



Attachment A – 5-Year Outline

Five-Year Storm Water Management Plan Outline
 Rhode Island Department of Transportation
 RIPDES Storm Water Phase II Compliance: March 2004-2009

Existing
 Proposed

Best Management Practice (BMP) or Task towards future BMP				Year															
				1				2				3				4			
				Spring '04	Summer '04	Fall '04	Winter '03-05	Spring '05	Summer '05	Fall '05	Winter '04-06	Spring '06	Summer '06	Fall '06	Winter '05-07	Spring '07	Summer '07	Fall '07	Winter '06-08
Task	BMP ID	Description/Measurable Goal	Responsible Party																
MEASURE 1: PUBLIC EDUCATION AND OUTREACH																			
Proposed Program: Partner with URI Cooperative Extension to Provide Training to State and Municipal Officials and Coordinated Public Outreach Message	1A, 1B	Measurable Goal: Educational materials selected and available for use by end of Year 2.	Environmental and Intermodal Planning					X	X	X	X								
Proposed Program: Website - Storm Water Page, SWMPP description, links, and Web-based resource library - guidance	1C	Measurable Goal: Storm Water page added to RIDOT website within Year 2. Years 3-5: update regularly	Public Information Department					X	X	X	X	X	X	X	X	X	X	X	X
Proposed Program: Publish storm water materials in DOA and RIDOT Newsletter.	1D	Measurable Goal: Develop and publish materials within Year 3.	Public Information Department/Environmental and Intermodal Planning									X	X	X	X				
Existing Program: RIDOT Winter Training existing program - erosion control, source reduction.	1E		Environmental and Intermodal Planning	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Proposed Program: Develop storm water training to be provided as part of the winter training program.	1F	Measurable Goal: Develop or contract for storm water training curriculum in Year 2. Continue through Year 5.	Environmental and Intermodal Planning					X	X	X	X	X	X	X	X	X	X	X	X

Five-Year Storm Water Management Plan Outline
Rhode Island Department of Transportation
RIPDES Storm Water Phase II Compliance: March 2004-2009

Existing
Proposed

				Year															
Best Management Practice (BMP) or Task towards future BMP				1				2				3				4			
				Spring '04	Summer '04	Fall '04	Winter '03-05	Spring '05	Summer '05	Fall '05	Winter '04-06	Spring '06	Summer '06	Fall '06	Winter '05-07	Spring '07	Summer '07	Fall '07	Winter '06-08
Task	BMP ID	Description/Measurable Goal	Responsible Party																
MEASURE 2: PUBLIC INVOLVEMENT AND PARTICIPATION																			
Existing Program: Adopt a Highway/Spot. Provide bags, litter picks, transportation, traffic control	2A		Maintenance Division	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Proposed Program: Partner with URI Cooperative Extension to Provide Public Outreach Program	2B	Measurable Goal: Develop partnership with an outreach group by the end of Year 3.	Environmental and Intermodal Planning									X	X	X	X				X
Existing Program: Fund clean up efforts - Prison cleanup crews; Woonasquatucket River Cleanup	2C		Maintenance Division	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Existing Program: RIDOT internal training.	2D		Environmental and Intermodal Planning/Maintenance Division	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Existing Program: Enhancement Program - document existing and funding for future. CMAQ Funded Projects.	2E		Design Office/ Environmental and Intermodal Planning	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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				1				2				3				4				5			
Task	BMP ID	Description/Measurable Goal	Responsible Party	Spring '04	Summer '04	Fall '04	Winter '03-05	Spring '05	Summer '05	Fall '05	Winter '04-06	Spring '06	Summer '06	Fall '06	Winter '05-07	Spring '07	Summer '07	Fall '07	Winter '06-08	Spring '08	Summer '08	Fall '08	Winter '07-09
MINIMUM MEASURE 3: ILLICIT DISCHARGE DETECTION AND ELIMINATION																							
Proposed Program: Select consultant/vendor to map storm water outfalls, Create Spatial Database (GIS) for Structure Attributes, Maintenance and Asset Management.	3Ai	Measurable Goal: Hire mapping vendor within Year 2.	Environmental and Intermodal Planning					X	X	X	X												
Proposed Program: Woonasquatucket River, Moshassuck River	3Aii	Measurable Goal: Complete mapping of outfalls within Woonasquatucket and Moshassuck River Watersheds within Year 2.	Environmental and Intermodal Planning					X	X	X	X												
Proposed Program: Runnins River, Pawtuxet River (North Branch), Narragansett Bay (Upper)	3Aiii	Measurable Goal: Complete mapping of outfalls within Runnins River, Pawtuxet River-North Branch and Narragansett Bay-Upper Bay Watersheds within Year 3.	Environmental and Intermodal Planning									X	X	X	X								
Proposed Program: Pawtuxet River (South Branch), Narragansett Bay (West Bay, Conanicut Island)	3Aiv	Measurable Goal: Complete mapping of outfalls within Pawtuxet River-South Branch, Narragansett Bay-West Bay and Conanicut Island Watersheds within Year 4.	Environmental and Intermodal Planning													X	X	X	X				
Proposed Program: Narragansett Bay (East Bay, Aquidneck Island), Westport River	3Av	Measurable Goal: Complete mapping of outfalls within Narragansett Bay-East Bay, Aquidneck Island and Westport River Watersheds within Year 5.	Environmental and Intermodal Planning																	X	X	X	X
Proposed Program: Pawcatuck River, Thames River, Coastal	3Avi	Measurable Goal: Complete mapping of outfalls within Pawcatuck River, Thames River, Coastal Watersheds within Year 5.	Environmental and Intermodal Planning																	X	X	X	X
Existing Program: Outfall location data collection completed Saugatucket River, Stafford Pond and Blackstone River Watersheds	3Avii		Environmental and Intermodal Planning																				
Proposed Program: Create Spatial Database (GIS) for Structure Attributes, Maintenance and Asset Management.	3B	Measurable Goal: Develop database with applicable parameters.	GIS Office					X	X	X	X												
Proposed Program: Evaluate and Select Asset Management Software	3Bi	Measurable Goal: Select preferred software within Year 2.	GIS Office								X												
Proposed Program: Purchase and install software	3Bii	Measurable Goal: Software rollout by end of Year 3	GIS Office												X								
Proposed Program: Select Area and Begin Pilot Project (Saugatucket River Watershed)	3Biii	Measurable Goal: Enter field data collected for the Saugatucket River Watershed outfall mapping within Year 3.	GIS Office												X								
Proposed Program: Complete Implementation, All other watersheds.	3Biv	Measurable Goal: Following pilot program, begin evaluating data collected in Year 3 mapping.	GIS Office												X	X	X	X	X	X	X	X	X
Proposed Program: Develop procedure for recording "additional elements".	3C	Measurable Goal: Design policy memo developed by end of Year 3.	Environmental and Intermodal Planning									X	X	X	X								
Existing Program: Drainage discharges to system accounted for through PAP system drainage. Volume limited by existing DPM.	3Di		Design Office	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Proposed Program: Adopt/Evaluate Design Policy Memo for New Connections/Discharges (to include geo-referencing).	3Dii	Measurable Goal: Revised DPM regarding drainage connections.	Design Office/Environmental Office								X												

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				Spring '04	Summer '04	Fall '04	Winter '03-05	Spring '05	Summer '05	Fall '05	Winter '04-06	Spring '06	Summer '06	Fall '06	Winter '05-07	Spring '07	Summer '07	Fall '07	Winter '06-08	Spring '08	Summer '08	Fall '08	Winter '07-09
Task	BMP ID	Description/Measurable Goal	Responsible Party																				
Proposed Program: Identify Existing Connections/Discharges Limited to review of PAP records for last three years and identification of significant contributors discharging to system.	3Diii	<u>Measurable Goal:</u> Identify existing connections/discharges.	Maintenance Division						X	X		X	X	X	X								
Proposed Program: Inspect storm water outfalls for dry weather flows.	3Ei	<u>Measurable Goal:</u> Survey Outfalls to identify Dry Weather Flows within Blackstone, Woonasquatucket and Moshassuck River Watersheds within Year 3.	Environmental and Intermodal Planning									X	X										
	3Eii	<u>Measurable Goal:</u> Survey Outfalls to identify Dry Weather Flows within Runnins River, Pawtuxet River-North Branch Narragansett Bay-Upper Bay Watersheds within Year 4.	Environmental and Intermodal Planning									X	X										
	3Eiii	<u>Measurable Goal:</u> Survey Outfalls to identify Dry Weather Flows within Pawtuxet River-South Branch, Narragansett Bay-West Bay and Conanicut Island Watersheds within Year 5.	Environmental and Intermodal Planning													X	X						
	3Eiv	<u>Measurable Goal:</u> Survey Outfalls to identify Dry Weather Flows within Narragansett Bay-East Bay, Aquidneck Island and Westport River Watersheds within Year 5.	Environmental and Intermodal Planning																		X	X	
	3Ev	<u>Measurable Goal:</u> Survey Outfalls to identify Dry Weather Flows within Pawcatuck River, Thames River, Coastal Watersheds within Year 5.	Environmental and Intermodal Planning																		X	X	
Proposed Program: Sample Outfalls under Dry Weather Conditions	3Fi	<u>Measurable Goal:</u> Sample outfalls at Saugatucket River and Stafford Pond.						X	X														
Proposed Program: Select consultant/vendor to sample storm water outfalls with dry weather flows.	3Fii	<u>Measurable Goal:</u> Hire vendor within Year 3.	Environmental and Intermodal Planning									X	X										
	3Fiii	<u>Measurable Goal:</u> Sample Dry Weather Flows within the Saugatucket River and Stafford Pond Watersheds within Year 3.	Environmental and Intermodal Planning									X	X										
	3Fiv	<u>Measurable Goal:</u> Sample Dry Weather Flows within Blackstone, Woonasquatucket and Moshassuck River Watersheds within Year 4.	Environmental and Intermodal Planning													X	X						
	3Fv	<u>Measurable Goal:</u> Sample Dry Weather Flows within Runnins River, Pawtuxet River-North Branch and Narragansett Bay-Upper Bay Watersheds within Year 4.	Environmental and Intermodal Planning													X	X						
	3Fvi	<u>Measurable Goal:</u> Sample Dry Weather Flows within Pawtuxet River-South Branch, Narragansett Bay-West Bay and Conanicut Island Watersheds within Year 5.	Environmental and Intermodal Planning																		X	X	
	3Fvii	<u>Measurable Goal:</u> Sample Dry Weather Flows within Narragansett Bay-East Bay, Aquidneck Island and Westport River Watersheds within Year 5.	Environmental and Intermodal Planning																		X	X	
	3Fviii	<u>Measurable Goal:</u> Sample Dry Weather Flows within Pawcatuck River, Thames River, Coastal Watersheds within Year 5.	Environmental and Intermodal Planning																		X	X	

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Task	BMP ID	Description/Measurable Goal	Responsible Party																
MEASURE 4: CONSTRUCTION SITE RUNOFF CONTROLS																			
Existing Program: Maintenance of construction site BMPs is required of the contractor per the standard contract specifications.			Construction Division	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Proposed Program: Review blue book and draft revision to make specification tighter.	4A	Measurable Goal: Outline for a revised specification available for use in Year 3.	Design Office									X							
Proposed Program: Modify standard specification to require inspection a minimum of once per week during or immediately after each storm or once per week during periods of dry weather or minor storms.	4B	Measurable Goal: Revised specification available for use in Year 3.	Design Office/Environmental and Intermodal Planning									X							
Proposed Program: Modify standard specification to require contractor to keep surplus erosion and sediment control materials on-site.	4C	Measurable Goal: Revised specification available for use in Year 3.	Design Office									X							
Proposed Program: Mandate inspection schedule to be once per week by Wednesday. To be completed by the contractor per the specification.	4D	Measurable Goal: Revised specification available for use in Year 3.	Design Office/Environmental and Intermodal Planning									X							
Proposed Program: Revise WBS/DPM to include project specific inspection checklist to be developed during design phase, identifying BMPs by station and sensitive areas to be inspected. Checklist to be used by designated RIDOT or contractor personnel.	4E	Measurable Goal: Revised WBS available for use in Year 3.	Design Office/Environmental and Intermodal Planning												X				
Existing Program: Inspection program on project specific basis.	4F		Environmental and Intermodal Planning	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Existing Program: Erosion and sediment control inspection techniques provided at RIDOT winter training.	4G		Environmental and Intermodal Planning	X				X				X				X			X
Existing Program: Standard specification requires contractor to control waste and dispose of properly.	4H			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Proposed Program: Modify RIDOT Policy to require preparation of SWPPPs for all projects to be included in Construction Documents (P,S&E) prepared by consultant during design phase. Contractor to sign NOI form and share liability.	4I	Measurable Goal: Revised WBS available for use in first quarter of Year 3.	Design Office									X	X	X	X	X	X	X	X
Proposed Program: Develop a contract enforcement mechanism for RIDOT to enforce BMPs.	4J	Measurable Goal: Outline of enforcement procedure available in Year 3.	Construction Division											X					
Proposed Program: Develop or contract for waste control training for RIDOT Resident Engineers and Inspectors.	4K	Measurable Goal: Training curriculum available for use in first quarter of Year 3.	Construction Division									X							

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				Spring '04	Summer '04	Fall '04	Winter '03-05	Spring '05	Summer '05	Fall '05	Winter '04-06	Spring '06	Summer '06	Fall '06	Winter '05-07	Spring '07	Summer '07	Fall '07	Winter '06-08
Task	BMP ID	Description/Measurable Goal	Responsible Party																
Implement Training Program.	4L	<u>Measurable Goal:</u> Training curriculum in use in first quarter of Year 3.	Environmental and Intermodal Planning									X				X			X
Proposed Program: Meetings with contractor prior to construction commencement to review environmental	4M	<u>Measurable Goal:</u> Procedure developed for conducting pre-construction environmental meetings	Environmental and Intermodal Planning							X				X				X	
Proposed Program: pilot program kick-off meetings on three projects.	4N	<u>Measurable Goal:</u> pre-construction environmental meetings held for three new projects during Year 3.	Environmental and Intermodal Planning										X	X					
Proposed Program: conduct meetings at project kick-off for 10 projects. Projects would be selected based on applicability.	4O	<u>Measurable Goal:</u> pre-construction environmental meetings held for ten new projects during Years 3, 4 and 5.	Environmental and Intermodal Planning													X	X		X X

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				Spring '04	Summer '04	Fall '04	Winter '03-05	Spring '05	Summer '05	Fall '05	Winter '04-06	Spring '06	Summer '06	Fall '06	Winter '05-07	Spring '07	Summer '07	Fall '07	Winter '06-08
Task	BMP ID	Description/Measurable Goal	Responsible Party																
MEASURE 5: POST CONSTRUCTION STORMWATER CONTROLS																			
Existing Program: Current RIDOT DPM requires that all new construction meet the State Water Quality Standards and redevelopment projects must incorporate retrofit actions to improve storm water quality to the maximum extent practicable.	5A		Design Office	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Existing Program: Current maintenance practices include snow removal, street sweeping and catch basin cleaning. Work is completed on an as needed/as possible basis. Completion of work is dependent on available manpower.	5B		Maintenance Division	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RIDOT Maintenance Districts do not have information regarding the locations of all drainage structures. (Will be addressed by Measure 3)	5C		Maintenance Division																
Proposed Program: Maintenance Personnel to be present at final acceptance of construction work. Audit to ensure project completeness.	5D	Measurable Goal: Maintenance division personnel present at final acceptance beginning third quarter of Year 3.	Maintenance Division									X	X		X	X	X	X	X
Proposed Program: Implement aggressive As-Built plan requirement. As-built plans would be prepared based on Resident Engineer's project diary, and made available to RIDOT staff, including maintenance through current plan file management system available on internal network.	5Ei	Measurable Goal: Develop an as-built plan policy during Year 3.	Chief Engineer									X	X	X	X				
	5Eii	Measurable Goal: As feasible, implement new policy as-built plan policy during Year 4.	Chief Engineer									X	X	X	X	X	X	X	
	5Eiii	Measurable Goal: Evaluate effectiveness of policy during Year 5. Revise or abandon program as appropriate.	Chief Engineer															X	X

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Task	BMP ID	Description/Measurable Goal	Responsible Party	Spring '04	Summer '04	Fall '04	Winter '03-05	Spring '05	Summer '05	Fall '05	Winter '04-06	Spring '06	Summer '06	Fall '06	Winter '05-07
MEASURE 6: GOOD HOUSEKEEPING FOR OPERATIONS															
Existing Program: Signage in Low Salt Areas	6A		Maintenance Division	X	X	X	X	X	X	X	X	X	X	X	X
Existing Program: Use of straight salt for de-icing on interstates and heavily traveled roadways. Reduces sedimentation and clean up requirements of sand applications.	6B		Maintenance Division	X	X	X	X	X	X	X	X	X	X	X	X
Proposed Program: Investigate developing a Deicing Management Program		Measurable Goal: Equipment investigated and evaluated by end of Year 5.	Maintenance Division												
Existing Program: Winter training for RIDOT Maintenance Personnel.	6C		Environmental and Intermodal Planning	X	X	X	X	X	X	X	X	X	X	X	X
Proposed Program: Develop storm water training program to be included in current training sessions.	6D	Measurable Goal: Storm Water training curriculum complete by end of Year 2.	Environmental and Intermodal Planning					X	X						
Proposed Program: Implement storm water training.	6E	Measurable Goal: Storm Water training curriculum included in winter training during the first quarter of each year beginning Year 3.	Environmental and Intermodal Planning									X			X
Existing Program: All Water Quality Units statewide inspected September 2002. Six of 24 require cleaning per manufacturer's specifications. RIDOT doesn't own equipment capable of cleaning these structures.	6F		Maintenance Division	X	X	X	X	X	X	X	X	X	X	X	X
Proposed Program: Rent equipment to clean Water Quality units and evaluate need to purchase equipment or subcontract the cleaning to a contractor.	6G	Measurable Goal: Cleaning equipment rented, used and evaluated. Decision made on future cleaning practices by end of second quarter of Year 3.	Maintenance Division									X	X		
Proposed Program: Implement Water Quality unit cleaning program	6H	Measurable Goal: Water Quality unit cleaning program in use beginning in third quarter of Year 3. All vortechs units to be inspected once annually and cleaned in accordance with manufacturer's specifications.	Maintenance Division											X	X
Proposed Program: Develop a Standard Operating Procedure for maintenance of swales.	6I	Measurable Goal: Develop standard operating procedure by end of first quarter of Year 3.	Maintenance Division/Environmental and									X			
Implement Standard Operating Procedure.	6J	Measurable Goal: Standard Operating Procedure in use beginning in third quarter of Year 3.	Maintenance Division/Environmental and										X	X	
Existing Program: Catch Basins. No inspection protocol. CBs cleaned on as-needed basis.			Maintenance Division/Environmental and	X	X	X	X	X	X	X	X	X	X	X	X
Existing Program: Northwest division all CBs cleaned within last three years. Newport all CB within last 2 years.	6K		Maintenance Division/Environmental and	X	X	X	X	X	X	X	X	X	X	X	X
Proposed Program: 600 catch basins will be cleaned annually state wide as manpower is available. Priority will be established based on results of cleaning records.	6L	Measurable Goal: 600 catch basins cleaned each year.	Maintenance Division					X	X	X	X	X	X	X	X
Proposed Program: Inventory existing detention basins.	6M	Measurable Goal: Database of detention basin locations by end of second quarter of Year 3.	Maintenance Division/Environmental and Intermodal Planning									X			
Proposed Program: develop inspection, maintenance, mowing protocol.	6N	Measurable Goal: Detention basin inspection and maintenance protocol available for use by third quarter of Year 3.	Maintenance Division/Environmental and Intermodal Planning										X		

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Task	BMP ID	Description/Measurable Goal	Responsible Party	Spring '04	Summer '04	Fall '04	Winter '03-05	Spring '05	Summer '05	Fall '05	Winter '04-06	Spring '06	Summer '06	Fall '06	Winter '05-07	Spring '07	Summer '07	Fall '07	Winter '06-08
Implement Protocol.	6O	<u>Measurable Goal:</u> Begin inspecting and maintaining detention basins. Ten (10) basins to be inspected annually beginning in first quarter of Year 4 and cleaned as necessary.	Maintenance Division/Environmental and Intermodal Planning													X	X	X	X
Proposed Program: Develop Standard Operating Procedure for maintaining drainage structures in wetlands.	6P	<u>Measurable Goal:</u> Standard operating procedure approved by RIDOT by end of Year 3.	Environmental and Intermodal Planning					X	X	X	X	X	X	X	X				
Proposed Program: Negotiate Memorandum of Agreement with RIDEM for maintaining drainage structures in wetlands.	6Q	<u>Measurable Goal:</u> Begin negotiating MOA with RIDEM during first quarter of Year 3.	Environmental and Intermodal Planning									X	X	X	X	X	X	X	X
Proposed Program: Develop method for tracking inspections of drainages structures.	6Ri	<u>Measurable Goal:</u> Evaluate current record keeping practices during Year 2.	Maintenance Division					X	X	X	X								
	6Rii	<u>Measurable Goal:</u> Conduct needs assessment regarding asset management software during Year 3.	Maintenance Division									X	X	X	X				
	6Riii	<u>Measurable Goal:</u> Evaluate needs for computer hardware to support record keeping and inspection effort. Requisition new equipment during Year 3.	Maintenance Division									X	X	X	X				
	6Riv	<u>Measurable Goal:</u> Implement new record keeping programs including software and hardware during Year 4.	Maintenance Division													X	X	X	X
Proposed Program: Develop a procedure for minimizing erosion of roadway shoulders.	6S	<u>Measurable Goal:</u> Develop process to identify, investigate problem and incorporate repair into construction contracts.	Maintenance/Design													X	X	X	X
Existing Program: Sweeping completed statewide on annual basis. Work order program currently in use allows for response to complaints.	6T	<u>Measurable Goal:</u> Track complaints and prioritize sweeping based on need.	Maintenance Division	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Proposed Program: Investigate feasibility of more frequent sweeping.	6U	<u>Measurable Goal:</u> Feasibility assessment complete in Year 3.	Maintenance Division/Environmental and Intermodal Planning									X	X	X	X				



Attachment B – Outfall Mapping Information

OUTFALL INSPECTION

Note: If more than one pipe is located in a single area, complete a separate sheet for each one. (Use the same Outfall ID for each pipe at the location, but assign a different Pipe ID to each pipe.)

Outfall ID: _____ Pipe ID: _____

State highway: _____

Sketch of outfall structures (if outfall has multiple pipes, indicate which one is reported on this sheet.) Indicate location of edge of pavement and nearest CB or MH. If possible, indicate # and direction of inlets into the CB or MH

Location Sketch	Plan View	Outfall Flows To:		
			Fresh	Tidal
		Stream/River		
		Lake/Pond		
		Wetland		
		Non-wetland		
		Unknown		

Pipe size (dia) _____ inches. Material: _____ Condition: _____

Headwall (Y/N): _____ Material: _____ Condition: _____

Flared End Section (Y/N): _____ Condition: _____

Rip-Rap (Y/N): _____ Condition: _____

Bituminous lined ditch (Y/N): _____ Condition: _____

Vegetated swale (Y/N): _____ Condition: _____

Problems Noted:

Distance to edge of pavement : _____ ft N W S E

Nearest Intersection: _____ Distance: _____ N W S E

Nearest UP #: _____ Distance: _____ N W S E

Photo looking into pipe: Disc # _____ Photo #: _____

Photo looking downstream: Disc # _____ Photo #: _____

Add'l Photos?

Data Dictionary – Information Collected Electronically by GPS Unit to Supplement Field Data Sheets

"Outfall Inspection", Dictionary

"Outfall", point, "", 5, seconds, 1, Code

"Outfall ID", text, 30, required, normal, Label1

"Pipe ID", text, 30, normal, normal

"State Road", text, 50, normal, normal

"Water Type", menu, normal, normal, Label2

"Tidal"

"Fresh"

"Unknow"

"Outfall Discharge", menu, normal, normal

"Stream/River"

"Lake/Pond"

"Wetland"

"Non-Wetland"

"Unknown"

"Pipe Type", menu, normal, normal

"Plastic"

"Concrete"

"Metal"

"Stone"

"Unknown"

"Pipe Size", text, 30, normal, normal

"Headwall", menu, normal, normal

"Yes"

"No"

"Unknown"

"Flared End", menu, normal, normal

"Yes"

"No"

"Unknown"

"Rip-Rap", menu, normal, normal

"Yes"

"No"

"Unknown"

"Bit Ditch", menu, normal, normal

"Yes"

"No"

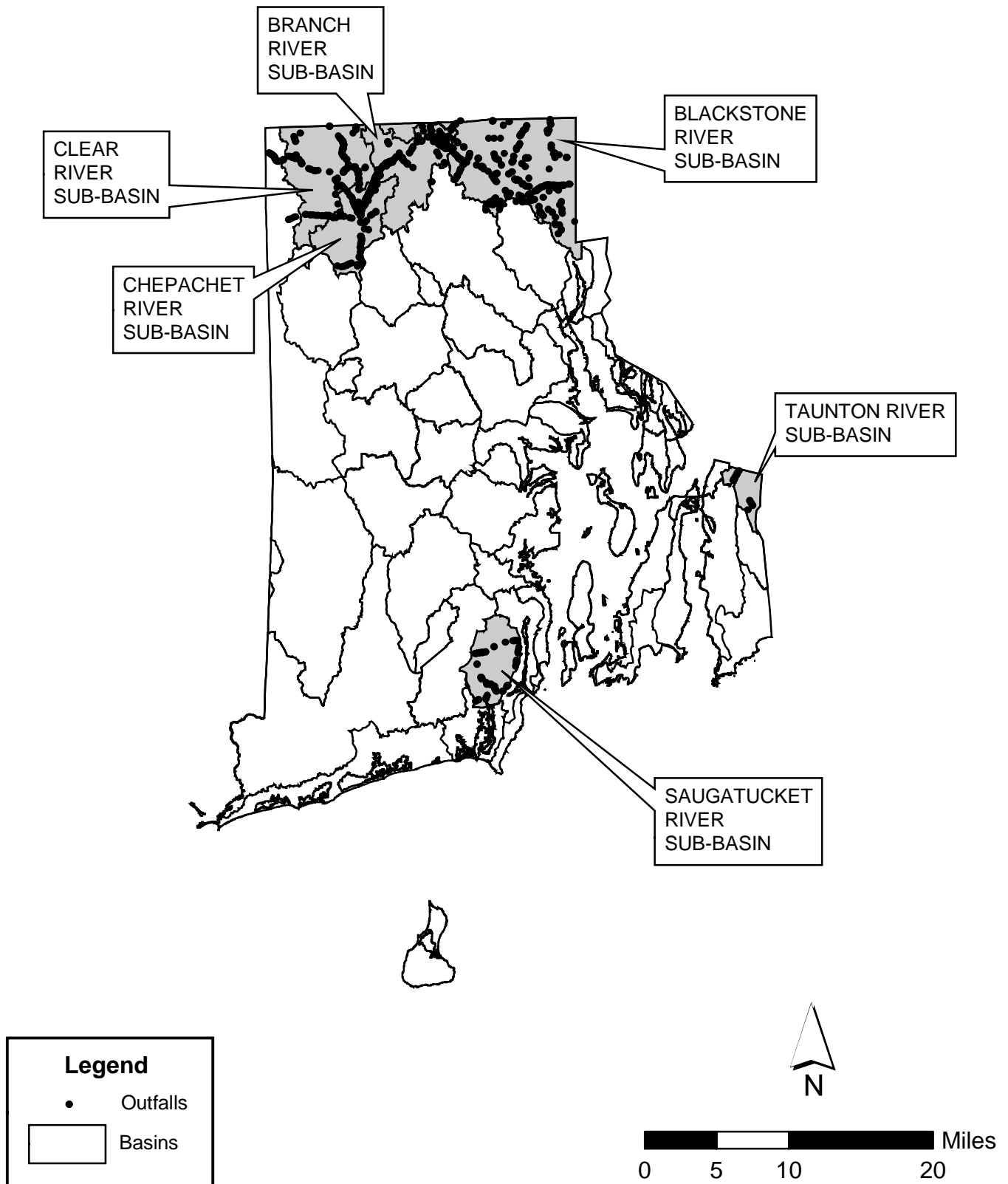
"Unknown"

"Swale", menu, normal, normal
 "Vegetated"
 "Non-Vegetated"
 "None"
 "Unknown"
"DWD", menu, normal, normal
 "YES"
 "NO"
"From Plans", menu, normal, normal
 "YES"
 "NO"
"Maintenance Concern", menu, normal, normal
 "YES"
 "NO"
"Date", date, auto, mdy, manual, normal, normal
"Water Body Name", text, 50, normal, normal
"Water Body ID", text, 50, normal, normal
"Contract Number", text, 30, normal, normal

"Catchbasin", point, "", 5, seconds, 1, Code
"Outfall", text, 30, normal, normal, Label2
"Inlets", menu, normal, normal
 "0"
 "1"
 "2"
 "3"
 ">3"
 "unknown"
"Date", date, auto, mdy, manual, normal, normal, Label1

"Manhole", point, "", 5, seconds, 1, Code
"Outfall", text, 30, normal, normal
"Inlets", menu, normal, normal, Label1
 "0"
 "1"
 "2"
 "3"
 ">3"
 "unknown", default
"Date", date, auto, mdy, manual, normal, normal, Label2

Mapped RIDOT Storm Water Outfalls as of August 2003





Attachment C – University of Rhode Island Cooperative Extension Partnership for Public Outreach and Participation

Appendix I

Scope Of Work

TITLE: Storm Water Phase II Public Outreach, Education, Involvement and Participation

PROBLEM/NEED:

Per the Storm Water Phase II regulations, Department of Transportation (DOT) is required to undertake a program of public education and outreach as well as public involvement. DOT believes that many aspects of these initiatives will be most efficiently developed and implemented via a contract for services. University of Rhode Island Cooperative Extension (URI) has successfully provided public outreach, education, involvement and participation on water quality issues (including storm water) to municipalities and the general public for many years and has developed a high degree of expertise in this arena.

PURPOSE:

The purpose of this project is to contract URI for services to establish DOT compliance with their obligations under Storm Water Phase II for Public Outreach and Education minimum measure. This project will also establish compliance with the following aspects of Public Involvement and Participation minimum measure that are related to public outreach and education of the Storm Water Phase II general permit:

- Identification of target audiences (Item IV.B.2.b.2(i)).
- Description of public involvement activities (Item IV.B.2.b.2(ii)).
- Evaluation of success (Item IV.B.2.b.4).

DOT will establish compliance with identification of target audiences, description of public involvement activities and evaluation of success for non-public-outreach-and-education activities through means other than this contract.

DEM will provide technical assistance to DOT by reviewing URI's deliverables for technical accuracy and compliance with Storm Water Phase II. After reviewing deliverables, DEM will forward their findings to DOT. No payment shall be made by DOT prior to DEM's review and approval; however, DEM shall be responsible for no contract administration beyond technical review of deliverables and notification of DOT.

In undertaking this effort, DOT anticipates that a number of very valuable public education and outreach tools will be produced that will be applicable to the Storm Water Phase II needs of Rhode Island municipalities and that will be valuable to the general public as tools for managing storm water.

GENERAL PROJECT PLAN:

DOT will contract with URI for the scope of services described below. In addition to the scope of services below, DOT will establish full compliance with their Storm Water Phase II Public Involvement obligations by developing and implementing:

1. Public involvement and participation program for compliance with identification of target audiences, description of public involvement activities and evaluation of success for all non-public-outreach-and-education activities.
2. A program for compliance with items 1, 2(iii) and 3 of public involvement and participation minimum measure of the Storm Water Phase II general permit and state public notice requirements.

DOT will also document the following items regarding development and implementation of their SWMPP:

1. Description of how the community was involved with development of DOT's Storm Water Phase II program (IV.B.2.b.1).
2. Public notification, including a process for receiving and responding to comments (IV.B.2.b.2(iii)).
3. Identification of individuals responsible for management and implementation of the public involvement and participation program (IV.B.2.b.3).

Additionally, DOT intends to maintain the following existing programs related to Storm Water Phase II Public Education and Outreach as described in the DOT 5-Year SWMPP (3/25/03) over the life of their permit (i.e., 5 years):

- Website (storm water page, SWMPP description, links and web-based resource library).
- Targeted outreach to their contractors on individual contracts.
- DOT should continue to pursue DOA technical assistance to public works twice per year as part of their SWMPP.

Although much work has been done to determine the best approaches to managing stormwater, there are still many areas of research need. DOT has worked with URI's Transportation Training Center to develop a research program. This program will be directed to coordinate research to amend its 5-year plan and focus on these areas. Two tasks are identified to reach this end:

1. Identify areas of research needs for focus by the Transportation Training Center using the local needs assessment (see scope of services below), stormwater manual revisions and recently developed Phase II regulations as a basis.
2. Amend the Transportation Training Center's grant policies to incorporate identified areas of research needs.

The combination of these initiatives will fully comply with public outreach and education and public involvement minimum measures of Storm Water Phase II.

A. Local Needs Assessment and Advisory Committee Development

The local needs assessment is intended to assist in determining the needs of municipalities in developing and implementing improved stormwater management (e.g., Phase II) programs. An advisory committee will be formed and use the assessment to guide work on other tasks. Lead participants will use the advisory as a sounding board for development of deliverables.

1. Conduct a needs assessment--This should include the following tasks:
 - Review of available municipal storm water management plans (SWMPs)--SWMPs include valuable information on municipal needs for storm water management including training needs (e.g., good housekeeping). This task would involve reviewing all available plans to infer and determine common needs. (Assume 33 plans will be available.)
 - Surveys of municipal stormwater management capacity--In recent years, surveys of municipal stormwater management capacity have been performed by several groups (e.g., Statewide Planning, Nonpoint Source, RIPDES, etc.). This survey will focus on training or technical assistance that communities will need for implementation of Phase II, implementation of municipal stormwater recommendations in TMDLs, other recommendations of municipal stormwater management plans and issues of particular municipal interest (e.g., flooding). The survey should also ask what municipal needs could potentially be filled by watershed organizations. The survey should focus on a small representative sample of municipalities (i.e., 5 - 10).
2. Advisory committee--As a follow-up an advisory committee will be formed to guide development of training and technical assistance. The committee should include but not be limited to: 3- 5 municipal representatives as well as representatives of DEM, DOT, Statewide Planning, Watershed Coordinating Council, Rivers Council, Conservation Districts, Audubon Society, Save The Bay, Conservation Law Foundation, Rhode Island Association of Conservation Commissions the URI Transportation Training Center, the Rhode Island League of Cities and Towns, and private sector representatives. URI will be responsible for administration of the advisory committee including, but not limited to, organizing mailing/email lists, calling and coordinating meeting dates, times and locations, developing agendas and facilitating meetings. . The Southern Rhode Island Conservation District (SRICD) will provide support including: providing meeting space, assisting in meeting facilitation, and developing meeting materials such as attendance sheets and minutes. The URI Coastal Institute will support coordination and information exchange among advisory committee members through the project website.

The advisory committee is expected to meet quarterly, on average, with communication maintained via web and email in the interim. In addition, URI will organize a work group consisting of municipal representatives responsible for implementation of Phase II stormwater programs, as described in TASK C. Coordination of this group will be directed to making Phase II requirements and obligations known in cooperation with DEM, obtain local feedback on materials developed, and facilitate transfer and adoption of products developed. Coordination with this group will be maintained by mail, email and web, and meetings with local officials organized by regions of the state.

A. Local Needs Assessment and Advisory Committee Development

Tasks	Participants ¹	Deliverables	Grant Budget	Month ²
1. Form and facilitate an advisory steering committee (see list of members above) with input from DEM and DOT	URI , SRICD	Steering committee membership, agendas, attendance sheets and minutes.	13,200	1 - 60
2. Conduct a needs assessment.	URI (LP, LJ) , DOT, DEM	Completed needs assessment.	5,000	3
			18,200	

¹ The participant that will lead the task is listed in bold type.

¹ Month numbers are based on the grant period. The first month begins on the date of the grant agreement approval. Month two begins on same number day of the following calendar month. Deliverables are to be completed at the end of the final month when listed as a range.

B. State, Municipal and Private Sector Training Curriculum

This part of the project is intended to assist state, municipal officials and other interested parties in the implementation of stormwater management programs. Six currently identified areas of need are training related to the revisions of the stormwater manual, Phase II--public outreach, Phase II--good housekeeping, Phase II--illicit discharge detection and elimination, development of stormwater-related ordinances and budget planning for operating and capital expenditures. Additional needs may be identified during the local needs assessment. Training developed under this section of the scope of work is expected to include a module on each of the aforementioned topics. The training should be designed to assist communities and state agencies (e.g., DOT) meet the requirements of their Phase II permits. The training program should be coordinated with DOT's existing staff training programs.

This task will be led by URI with training objectives, workshop/ conference agendas, educational modules , and program evaluations conducted in cooperation with the advisory committee. Where noted, subcontractors will be responsible for development and delivery of specific training topics. RIDEM will assume the lead role in conducting training on the Stormwater manual and Illicit detection, with URI providing support. For other programs, URI responsibilities will include design, printing and distribution of workshop/conference brochures, meeting notices and publicity, coordination with trainers, organizing and printing handouts, meeting room arrangements, catering, and registration. Advisory group members will provide support by making mailing/ email lists available, expanding publicity, and assisting with meeting logistics. The SRICD will provide general support with meeting logistics and manage subcontracts with the LID center and stormwater manual trainers. Conference and workshop fees may be charged to offset basic expenses not included in the budget for this task, including travel and expenses for presenters, printing handouts, meals and room fees, conference organization fees and other expenses. A sliding fee scale and/or incentives will be offered to state, local and non-profit organizations.

Workshop publicity, registration and products developed will be made easily accessible via the project website, to be developed and maintained by the URI Coastal Institute. Where appropriate, the URI Coastal Institute will assist in coordinating educational and outreach efforts with statewide coastal management initiatives being undertaken under the umbrella of the Coastal Institute.

1. Stormwater Manual (assume biennial workshops over the permit term)--The first edition of the Stormwater Manual was written and published during the early 90s. Since its publication there have been many advances and the manual is now being revised. Once the revision is completed, training will be needed to ensure proper use of the manual by regulators and the regulated community (e.g., design professionals). RIDEM will assume the lead role in conducting this training, with support from URI Cooperative Extension in designing the agenda, support from the SRICD and URI in managing training subcontracts, and logistical support. Two primary areas of training need include:

- Proper use of best management practices (e.g., low impact development (LID), better site design). Nonstructural methods have emerged as the state-of-the-art approach to addressing water quality and hydrologic impacts of stormwater runoff among leading national and state stormwater managers, however, these methods have not been widely used in Rhode Island. Training in these approaches will be conducted by the Low Impact Development Center or comparable organization using a two-level approach. 1) One basic 2-day training program will be offered, customized to state-specific conditions and needs, focusing on understanding of LID concepts, selection of appropriate methods, and in-depth LID treatment system planning and design. 2) To accelerate adoption of these methods, additional training and technical support will be provided by the LID center to state regulators and private sector stormwater system designers. The type of assistance will be finalized with input from the advisory committee and may include one or more of the following services: a) final review and recommendations on the RI stormwater manual, focusing on nonstructural stormwater control standards and design methods; b) development of guidance in selecting watershed-based stormwater treatment standards using LID methods; c) development of educational materials to support application of the storm water manual; d) follow-up specialized training for State, municipal and private sector stormwater system designers in LID methods; e) design review assistance for state/municipal stormwater managers and regulators; and f) design review assistance for private sector stormwater system designers as an incentive for early adoption of LID methods or DEM/CRMC requirement to mitigate stormwater impacts to sensitive areas or impaired waterbodies.
- Revised methodologies for stormwater management and design, including updated treatment system designs and assessment methods such as Stoke's Law and Darcy's Law Training will be provided by design professionals familiar with the updated RI stormwater manual, with preference given to authors of the manual. This portion of the training will held biennially for municipal, state and private sector audiences, with additional training in alternate years targeting DOT and other state agency /municipal staff.

To support implementation of the stormwater manual, SRICD will develop and conduct training in use of TR55 to estimate stormwater runoff volume, rates and comparison of pre- and post-development hydrology as required for stormwater systems design using either conventional or Low Impact Development Methods. This training will be offered at least twice during the project period, in coordination with stormwater manual training and following the basic 2-day LID training. Materials developed by the LID center or other readily available sources may be used as the basis for this training. Project funds will be used to support adapting existing curriculum to Rhode Island soils, with workshop fees used to offset costs of providing training.

2. Public Outreach (assume biennial workshops over the permit term at month 20 and 44 of this grant agreement)--Phase II requires municipalities to develop public outreach regarding the impacts of stormwater on local waterbodies. Municipal officials need training regarding:

- Scope of the stormwater problem and how it affects urban, suburban and rural areas differently.
- Methods of public outreach/education and effective delivery of outreach/education messages by municipalities to residents and others within the community. (Refer to task C for the specific outreach program.)

This element will focus on making materials and outreach methods developed under Task C readily available to municipalities. Outreach may be conducted through meetings with groups of communities with similar needs regionally rather than statewide workshops.

3. Good Housekeeping (assume biennial workshops over the permit term)--Phase II regulations require that municipalities perform certain types of maintenance on their municipal storm sewer systems, properties and infrastructure. Three areas where training is needed include:

- DPW site design, operation and maintenance (coordinated with EPA as appropriate).
- Municipal storm sewer system design, operation and maintenance.
- Grounds management. (The Greenshare Program at URI could be used and augmented as necessary for this purpose.)

Outreach to municipalities, DOT, and other state agencies on these topics will be closely coordinated with development and delivery of educational materials under Task C 6. The SRICD will coordinate with EPA, DEM and DOT to organize and deliver training on these topics, with URI leading grounds management education. The focus of information delivery will be to enhance capacity of supervisors and field engineers using a 'train the trainer' approach to educate field staff responsible for routine roadway maintenance / and public facilities management.

4. Illicit Discharge Detection and Elimination (assume one workshop over the permit term, the first training should be offered by month 18 of this grant agreement)--Phase II regulations require owners of municipal storm sewer systems to identify and eliminate all illicitly discharging connections to their systems. A good program necessitates a general knowledge of the layout of the sewer system, proper policy for illicit discharge prohibition, moratorium and inspection, and development and implementation of inspection programs. RIDEM will assume the lead role in this training, in conjunction with USEPA. URI Cooperative Extension will provide support to coordinate and organize the program. The following have been identified as areas of training need:

- Mapping storm sewer systems and recommend uniform mapping methodologies (e.g., RIGIS) and guidance.
- Developing and implementing policy (e.g., ordinances) for control of illicit discharges.
- Establishing an inspection program.
- Illicit discharge detection and elimination (IDDE) techniques consistent with the New England Interstate Water Pollution Control Commission's IDDE manual.

- Appropriate roles for various MS4 owners (e.g., DOT, municipal, DEM, etc.) to coordinate on solving interconnection issues efficiently.
5. Development and Amendment of Ordinances and Enforceable Policies (assume biennial workshops over the permit term, annotated ordinances should be developed by month 6 of the grant agreement and training should be offered by month 12 of the grant agreement)--Phase II requires the development of various enforceable policies (e.g., soil erosion, stormwater maintenance, pet waste, illicit discharge, etc.). Additionally, there are a number of ordinances that would be particularly helpful for communities (e.g., redevelopment standards, stormwater utility districts, etc.).

This task will involve consideration of the need for annotated model ordinances and the compilation of examples of best available existing ordinances. The need for annotated model ordinances will be determined in conjunction with the advisory committee. Selected model ordinances will then be developed with input from the advisory committee.

At a minimum, the following ordinances will be considered:

- Soil erosion.
- Stormwater maintenance.
- Pet waste.
- Illicit discharge.
- Redevelopment standards.
- Stormwater utility districts.

URI Cooperative Extension will lead this task, with the SRICD providing support in review and development of ordinances. In addition the SCRCD will assume primary responsibility for development of model ordinances and enforceable policies for soil erosion, stormwater maintenance and stormwater utility districts. SRICD will also coordinate with DEM and EPA to finalize and annotate illicit discharge detection ordinances.

6. Budget Planning (assume one workshop over the permit term--Phase II and stormwater TMDLs will require communities to develop new operations and infrastructure, for which they may have limited experience in budgeting. This task will provide training to municipalities in how to develop operational and capital budgets and identify funding sources for stormwater management programs. The focus will be on creative strategies to fund stormwater programs using for example, permit application fees to cover costs of stormwater plan review and field inspection by independent contractors, stormwater system maintenance fees based on impervious area, and pollutant trading fees and credits to offset increased runoff impacts where all other measures have been taken to minimize impacts. This element will be closely coordinated with development of ordinances and enforceable policies.

7. Additional Training (assume annual workshops over the permit term)--The following programs related to Storm Water Phase II Public Education and Outreach as described in the DOT 5-Year SWMPP (3/25/03) will be developed. Training will be coordinated with and designed to augment existing programs currently offered by RI DOT. To the extent possible, curriculum items 1-6 above will be designed to address DOT training needs and schedules to the extent possible. Materials developed in these preceeding elements (such as “good housekeeping” information in element 3 above, and in Task C of this project will be made available to RIDOT field engineers and highway/ facilities maintenance staff using a “train the trainer” approach to reach all appropriate staff.

- DOT winter training program.
- Stormwater, erosion control and source reduction training.

Summary of training topics and schedule

Training topic	Annual	Biennial	One time
1. Stormwater manual		X	
2. Public outreach		X	
3. Good Housekeeping		X	
4. Illicit Discharges			X
5. Ordinances & Enforcement		X	
6. Budget Planning			X
7. Additional DOT training	X		

* Stormwater system design may be offered to DOT and other state/government staff in alternate years biennially.

All training materials, including presentations and accompanying educational materials will be made available through the project website. Availability of these materials will be publicized through established communication networks such as listserves, newsletters, professional publications and general interest news features.

B. State, Municipal and Private Sector Training Curriculum Development

Tasks	Participants*	Deliverables	Grant Budget	Month
1. Prepare a list of training needs based on this scope of work (7 needs listed in the narrative above) and the local needs assessment. Solicit review and comment from the advisory committee.	URI (LJ, LP) , Advisory Committee	List with consensus from the advisory committee.	3,000	4 (or March 10, 2005, which ever is earlier) ³
2. Prepare outlines of training modules and solicit review and comment from the advisory committee.	URI, (LJ, LP), SRICD, Advisory Committee	Outlines of training modules. Comments from the advisory committee.	10,000	6
3. Draft training modules and solicit review and comment from the advisory committee.	URI, SRICD, Advisory Committee	Drafts of training modules. Comments from the advisory committee.	70,000	6 - 10
4. Finalize training modules and establish workshop schedules for each module with input from the advisory committee. Make updates to modules as needed with input from the advisory committee.	URI, SRICD, Advisory Committee	Schedule of workshops.	18,000	11, 23, 35, 47
5. Hold workshops for each module.	URI, RIDEM, SRICD, LID Center, stormwater manual training consultant.	Workshops and workshop materials including: mailer to audience, agenda, handouts (e.g., training module) and other items as appropriate	100,600	12-60
			201,600	

* Under Tasks B 1,2,3,4 and 5 RIDEM will be primarily responsible for development of training on the Stormwater Manual and Illicit Discharge Detection and Elimination, with URI coordinating and conducting the workshops.

³ Regulatory deadlines require that this task is completed by March 10, 2005.

C. Model Stormwater Education and Outreach Program

Over the years, agencies and organizations have authored a myriad of brochures related to stormwater management, nonpoint source pollution and related water quality issues. Although these public outreach materials each cover important issues, readers often have questions about the relative importance of recommendations and occasional divergence. This ambiguity has led to confusion. As required by the Phase II stormwater regulations, communities are required to have a stormwater education and outreach program. What is needed is a model stormwater education program that is peer reviewed and addresses different sources of stormwater contamination that are common in rural, suburban and urban communities. These model education and outreach materials should be prepared with a menu of options based on capacity to deliver the message and budget. All materials must be evaluated per literature or field-testing (see item C.7, pre-survey assessment and piloting) to determine their effectiveness. Additionally, many agency partners would benefit from the availability of a ready message in an easy-to-deliver format. This task will be led by URI Cooperative Extension. Dr. Marion Gold, director of the Cooperative Extension Education Center will lead development and implementation of a model stormwater education and outreach program focusing on development and delivery of consistent messages on the need for stormwater controls using a variety of media. The URI Nonpoint Education for Municipal Officials program, coordinated by Lorraine Joubert, will focus on application of source-specific materials for use by municipalities and state agencies in implementing customized stormwater education programs. The following seven tasks are to be undertaken:

1. Review current outreach materials used in Rhode Island for stormwater management (especially, FHWA, EPA, DOT and DEM materials). A minimum level of effort will be devoted to this task, taking advantage of materials collected by DEM. It is likely that additional materials will be identified and incorporated as the project progresses.
2. Review national literature for comparative purposes and identify other appropriate outreach materials, messages and delivery methods. Additional materials will be reviewed as new sources are identified.
3. Prepare a consistent message for state agencies, communities and watershed organizations) regarding why the public should be concerned about the impacts of stormwater on receiving waterbodies. Solicit review and comment from the advisory committee. In designing this outreach campaign, URI will work with consulting professionals to develop or adapt the most compelling messages for Rhode Island audiences.
4. Identify best available options for delivery of the messages and materials discussed in task 3 and 6. A variety of media will be used to test cost effectiveness of outreach methods considering methods appropriate for initial outreach and a sustainable level of outreach beyond the life of the project. Development of public information campaign will draw on the expertise of communication specialists within the University and other media services.
5. Deliver the consolidated state-agency message in task 3. (This will be an ongoing commitment over the life of the permit, i.e., 5-year term.)
6. Using the consistent message in task 3 as a starting point, develop source-specific contamination outreach messages and materials. While the consistent messages on

importance of runoff control developed in subtask D 3 are essential for raising general awareness of stormwater runoff as a pollution source, and reaching a large audience through popular media, materials developed in this subtask will be directed to specific audiences to promote change in behavior. As a starting point, URI will work with the advisory group to identify desired changes in behavior among residents/businesses in different types of watersheds/aquifer recharge areas based on priority pollution sources and impacts to receiving waters. All materials must be in easy-to-deliver formats for users at a variety of levels (e.g., watershed-association, municipal, etc.). Focus the messages on audiences (i.e., message recipients), sources and pollutants that are likely causing the greatest stormwater impacts as determined by the advisory committee. Sources of pollutants should be consistent with the general permit (Part IV.B.1.b.5). Pay special attention to industrial and residential contributors, sources and pollutants. Work with the advisory committee to determine appropriate formats. Products should be readily available to municipal users (e.g., web-based and downloadable formats). As part of this item, develop a model public education and outreach plan that can be easily tailored to the local needs and be incorporated into municipal SWMPPs. The outreach plan will identify specific opportunities to capture attention and provide information and/or incentives to change behavior given existing methods whereby residents and landowners receive information from municipalities and keep informed on local issues in general.

To ensure local participation in development of this model outreach program, this element will be coordinated with municipal representatives responsible for implementation of Phase II stormwater programs. URI will organize and coordinate a municipal work group with support from DEM, SRICD and other members of the advisory committee. This will provide a direct communication link with communities to make Phase II requirements and obligations known, obtain local feedback on materials developed, and facilitate transfer and adoption of products developed. Coordination with this group will be maintained by mail, email and web, and meetings with local officials organized by regions of the state. This element will be closely linked to development and delivery of public outreach education under Task B 2 as well as local educational outreach necessary to generate public awareness of the need for stormwater controls that may be subject to local ordinances and enforceable policies under Task B 5.

7. Run a pre-survey for each type of audience and stormwater contamination source, followed up by post-survey after the outreach is conducted to see how effective the program was. Determine what outreach materials/methods are the most cost effective to reach the target audience and effect some change in awareness or behavior. This may be a function of the particular stormwater issue to be addressed. Make adjustments before going ahead with full program. The pre and post survey work will only be needed where the literature or the advisory

committee is not able to verify the effectiveness of a given outreach message or technique. This assessment may be conducted using a variety of methods, to include for example, focus groups, interviews and/or survey. Professional services will be retained to evaluate effectiveness of outreach messages in changing attitudes and behaviors through pre- and post- evaluations of outreach messages and training programs piloted on a small scale before wide-scale delivery.

C Coordinated Stormwater Message for Use in Public Outreach

Tasks	Participants	Deliverables	Grant Budget	Month
1. Review and collect current outreach materials used in Rhode Island for stormwater management (especially, FHWA, EPA, DOT and DEM materials).	URI (LP, LJ)	Library of stormwater outreach materials and literature.	1,200	1
2. Review national literature for comparative purposes and identify other appropriate outreach materials, messages and delivery methods.	URI (LP, LJ)	Appropriate materials added to the library. Compendium of recommended delivery methods.	1,200	1
3. Prepare a consistent message for state agencies, communities and watershed organizations regarding why the public should be concerned about the impacts of stormwater on receiving waterbodies. Solicit review and comment from the advisory committee.	URI (LP, LJ, MG) , SRICD, Advisory Committee	Message in easy-to-deliver formats for partners at a variety of levels.	15,100	3
4. Identify best available options for delivery of the messages and materials discussed in task 3 and 6.	URI (LP, LJ, MG) , Advisory Committee	List of options for delivery of the messages.	5,000	4 (or March 10, 2005, which ever is earlier) ⁴

⁴ Regulatory deadlines require that this task is completed by March 10, 2005.

5. Deliver the consolidated state-agency message in task 3. Continue delivery of consolidated message.	URI (MG) , Advisory Committee	Delivery of the consolidated state-agency message.	216,800	10 - 60 ⁵
6. Using the consistent message in task 3 as a starting point, develop source-specific contamination outreach messages and materials.	URI , SRICD, Advisory Committee	Source-specific contamination outreach messages and materials	160,000	18
7. Run a pre-survey followed up by post-survey after the outreach is conducted to see how effective the program was. Make adjustments to the outreach program as needed.	URI (MG, LP) Advisory Committee	Results of the survey. Final outreach program and message for DEM and DOT.	16800	9
			\$ 416,100	

⁵ Evaluate message and delivery annually to determine if any changes to the message or delivery approach are needed and make changes as needed.

D Implementation Schedule, Evaluation and Assessment

Phase II requires realistic schedule for implementation of all strategies and elements, which should focus on a five-year timeframe. Phase II also requires reporting that includes the following elements:

- Status of compliance with permit conditions, including an assessment of the appropriateness of the selected BMPs and progress toward achieving the selected measurable goals.
- Results of any information collected and analyzed.
- Summary of the storm water activities planned for the next reporting cycle.
- Change in any identified best management practices or measurable goals.
- Notice of relying on another governmental entity to satisfy some of the permit obligations.

This part of the project will focus on development of an appropriate implementation schedule as well as evaluation and assessment of all work performed for it. As with other parts of the project the advisory committee will be utilized as a sounding board for the work. As a starting point, URI will work with DEM and DOT to identify specific measures of compliance by which municipal progress in meeting permit conditions will be evaluated. To ensure consistency throughout the project and among various activities and project partners, URI will be responsible for this task. Assessment reports submitted under Subtask D 3 will include summary results of project effectiveness based on assessments conducted in Task C under the direction of Dr. Marion Gold.

D. Implementation Schedule, Evaluation and Assessment

Tasks	Participants	Deliverables	Grant Budget	Month
1. Develop an implementation schedule each permit year for each set of tasks in the scope of work and solicit review and comment from the advisory committee.	URI (LJ, MG), Advisory Committee	Draft implementation schedule with comments from the advisory committee.	5000	3, 15, 27, 39, 51
2. Incorporate comments from the advisory committee and present to DOT and DEM for final approval.	URI (LJ, LP)	DEM/DOT approved implementation schedule.	3000	4, 16, 28, 40, 52
3. Draft annual evaluation and assessment reports for this scope of work each permit year and solicit review and comment from the advisory committee.	URI (LP, MG), Advisory Committee	Draft annual evaluation and assessment reports. Comments from the advisory committee.	20,000	Jan 10 each annum, starting in 2005.
4. Incorporate comments from the advisory committee and present report to DOT and DEM for final approval.	URI (LJ, LP), Advisory Committee	DEM/DOT approved report.	3000	Feb 10, each annum, starting in 2005.
5. With assistance of advisory committee, adjust implementation schedule as needed based on annual evaluation. Provide any recommended changes to DOT/DEM for final approval	URI (LP, LJ), Advisory Committee	Adjusted implementation schedule with DEM/DOT approval.	4600	Mar 10, each annum, starting in 2005.
			35,600	

DELIVERABLES

Task A:

- Steering committee membership, agendas, attendance sheets and minutes.
- Completed needs assessment.

Task B:

- List with consensus from the advisory committee.
- Outlines of training modules. Comments from the advisory committee.
- Drafts of training modules. Comments from the advisory committee.
- Schedule of workshops.
- Workshops and workshop materials including: mailer to audience, agenda, handouts (e.g., training module) and other items as appropriate

Task C:

- Library of stormwater outreach materials and literature.
- Appropriate materials added to the library. Compendium of recommended delivery methods.
- Message in easy-to-deliver formats for partners at a variety of levels.
- List of options for delivery of the messages.
- Delivery of the consolidated state-agency message.
- Source-specific contamination outreach messages and materials
- Results of the survey. Final outreach program and message for DEM and DOT.

Task D:

- Draft implementation schedule with comments from the advisory committee.
- DEM/DOT approved implementation schedule.
- Draft annual evaluation and assessment reports. Comments from the advisory committee.
- DEM/DOT approved report.
- Adjusted implementation schedule with DEM/DOT approval.

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ESTIMATED TOTAL COST, STATE AND MATCH AMOUNTS:

TOTAL: \$ 671,500